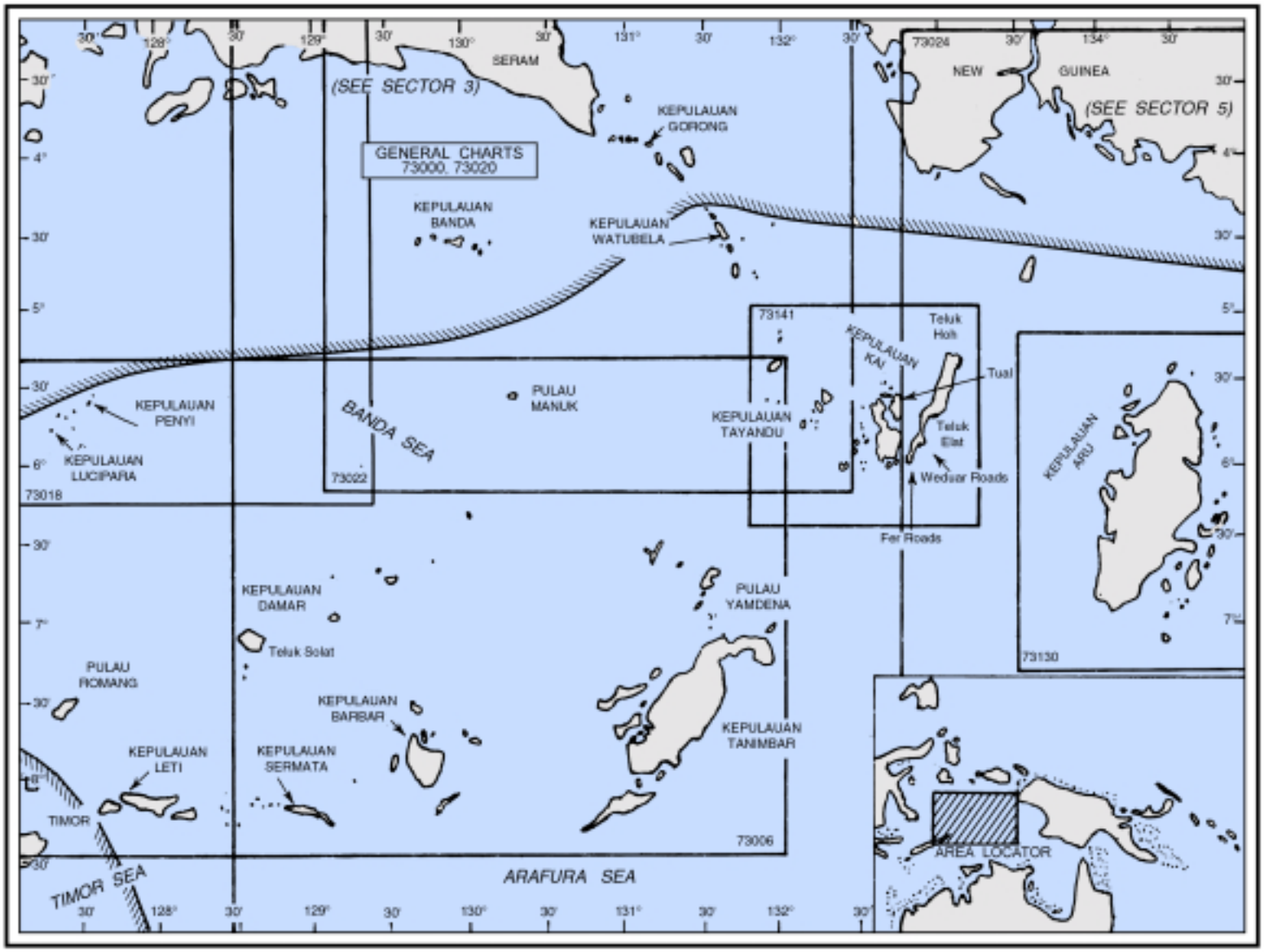

Additional chart coverage may be found in CATP2, Catalog of Nautical Charts.

SECTOR **4** — CHART INFORMATION

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SECTOR 4

BANDA SEA AND OFF-LYING ISLANDS

Plan.—This sector describes the Banda Sea briefly, then Kepulauan Kai, Kepulauan Aru, Kepulauan Barbar, Kepulauan Tanimbar, and the smaller islands in their vicinity.

Banda Sea

4.1 The Banda Sea is generally regarded as being within the area bounded as follows: on the N, the chain of islands extending SE from the E extremity of Sulawesi to and including Seram; on the E, the chain of islands between the SE end of Seram and Kepulauan Kai, then to Kepulauan Tanimbar; on the S, the chain of islands between Kepulauan Tanimbar and the NE part of Timor then by the chain of islands between this part of Timor and the E extremity of Flores; on the W, the chain of islands between the E extremity of Flores and the S end of Sulawesi and by the SE side of the latter island.

The islands of Kepulauan Banda would properly be included in the description of this sea, but for the sake of convenience they have been included with the islands adjacent to Seram and have been described in the preceding sector beginning in paragraph 3.45. The islands of Kepulauan Tukanbesi and Timor and Wetar together with the islands W of them are described in Pub. 163, Sailing Directions (Enroute) for Borneo, Jawa, Sulawesi and Nusa Tenggara. Pulau Kisar and the islands E of Timor are described in this sector beginning in paragraph 4.53.

Tides—Currents.—Very little is known about currents in the open part of the Banda Sea, except that the winds set up perceptible surface movements. In the W part of the sea, S of Kepulauan Banggai and Kepulauan Sula, the current sets ESE at the rate of 0.8 knot to 2 knots during the NNW monsoon and sets NNW at a rate of 0.6 knot to 2 knots during the SSE monsoon. During both seasons, most of the flow is in the N part of the Banda Sea; in the S the rates are weak and direction of set is very variable.

Kepulauan Lucipara

4.2 **Kepulauan Lucipara** (5˚29'S., 127˚31'E.), in the central part of the Banda Sea about 110 miles SE of Buru Island, consists of four coral islands named Mai, Laponda, Kaurangka, and Selatan. These islands are on a reef about 5 miles long in a NW-SE direction.

Although the islands are uninhabited, turtle fishermen from Buru Island and Ambon frequent them during October, November, December, and sometimes April.

The islands are wooded and bearings can be taken at a distance of as much as 15 miles. The tallest trees, more than 30m high, are on Mai. The reef is so steep-to that there are no good places to anchor, but boats may be landed at several places on the lee side with a calm sea. Drinking water can be obtained from well on the NW side of Mai. The islands are a good radar target at a distance of 15 miles. Irregular currents and whirlpools have been observed close S and NW of the islands.

Caution.—The reefs surrounding Kepulauan Lucipara have extended considerably and caution should be observed when in the vicinity.

Beting Sekaro (Skaro Reef) (5˚35'S., 127˚28'E.), a reef about 6 miles SW of Kepulauan Lucipara, is separated from that group by a clear deep channel. The reef, about 3 miles long, has two white sandbanks that cover only during exceptionally HW. A stranded wreck on the NE side of the reef was reported radar conspicuous.

Kepulauan Penyu

4.3 **Kepulauan Penyu** (Schildpad Islands) (5˚23'S., 127˚47'E.), about 15 miles ENE of Kepulauan Lucipara, consist of three low coral islands, Mai (not to be confused with the island of the same name in the nearby Kepulauan Lucipara group), Kadola, and Bingkoedoe. These islands are on a reef and are separated from each other by clear deep channels. Exercise caution when approaching these reefs because they have extended considerably. Because of their high trees the islands can be identified at a distance of 15 to 16 miles. The steep coral reefs that fringe these islands make anchorage impossible.

Pulau Manuk

4.4 **Pulau Manuk** (Manoek) (5˚33'S., 130˚18'E.), about 150 miles E of Kepulauan Penyu, is a cone-shaped volcanic island, 285m high, 1 mile long NNW-SSE and 0.5 mile wide. In the center of the island is an open crater best seen from SSE. No eruptions have been recorded, but sulfurous fumes have been reported to rise from the crater and there is a large amount of sulfur on the island. The lower part of the N side of the island is wooded. On the W side of the island there is a small sandy beach. A coral reef, projecting out about 183m in its N part, skirts the shore between the beach and the NW extremity of the island.

Small craft can anchor in 81m about 0.15 mile from the sandy beach in calm weather, and during the transition period of the monsoons (April and November).

Kepulauan Watubela

4.5 **Kepulauan Watubela** (4˚33'S., 131˚43'E.), about 60 miles SE of the SE end of Seram, includes Ingar, Pulau Watubela (Watoebela), Pulau Kaisiui (Kaisioei), Pulau Kurkap (Koerkap), Pulau Baam, Pulau Tioor, and Pulau Uran (Oeran). The first three are on a long, steep-to submarine plateau with depths of less than 201m. The remaining islands are on separate reefs surrounded by very deep water.

Pulau Ingar (4˚21'S., 131˚33'E.), the N most of the group, is low and entirely surrounded by a white sandy beach. It is uninhabited, but there are coconut plantations belonging to inhabitants of Pulau Watubela. Pulau Watubela is covered with

large trees and there are several large villages. Dadan, its summit, is 215m high and is distinctive from E and W. Pulau Kasiui (Kasioei), separated from Pulau Watubela by Selat Horot Lomi, a strait which is about 0.5 mile wide, is the largest island of the group. The use of Selat Horot Lomi is not recommended because of strong tidal streams accompanied by heavy tide rips; the fairway is narrowed to a width of about 0.2 mile by a reef extending from the S side of Pulau Watubela. The highest of Pulau Kasiui's several hills, 2.75 miles from the SE end of the island, is 352m high. There are several villages on the island. On Pulau Baam there are two hills, the N 80m high and the S 62m high, separated by a low sandy area which makes it appear as two islands. A wide drying reef surrounds the island. Pulau Kurkap (Koerkap), 6.5 miles E of the SE end of Pulau Kasiui, is low, flat and surrounded by a wide drying reef. A detached reef which dries is about 0.5 mile E.

Pulau Tioor (4˚45'S., 131˚44'E.), about 5.5 miles S of Pulau Baam is almost entirely rugged hilly land rising to a height of 376m. The N coast and the greater part of the E coast is fringed with a drying reef. Shoals with depths of 7 and 10m are off the middle of the E side of the island, about 0.75 mile and 1.25 miles, respectively, offshore.

Pulau Uran (Oeran) (4˚46'S., 131˚52'E.), 6.5 miles E of Pulau Tioor, is low, sandy, and mostly covered with coconut trees. An extensive drying reef surrounds the island.

Pulau Baam, Pulau Kurkap, and Pulau Uran are all uninhabited, but have coconut plantations.

In the otherwise deep and clear passage between Pulau Tioor and the N most island of Kepulauan Kai, to the S, there are three shoals with depths of 4.9, 9.1, and 10.9m which are 16 miles SSE, 21 miles SE, and 23 miles SE, respectively, from the S end of Pulau Tioor.

Tides—Currents.—In the vicinity of Kepulauan Watubela the flood current has been found to set E and the ebb current W. The strength of the flood current is increased during the NW monsoon, and that of the ebb during the SE monsoon. Between the islands the strength of the currents is often considerable. In February and March current with a velocity of 3.5 knots has been reported. When the monsoons are blowing with their maximum velocity, strong rips are set up off the N and S ends of the islands.

Anchorage.—There are no good anchorages in Kepulauan Watubela but there are several places where temporary anchorage may be taken. Anchorage is available close NW of Pulau Ingar in 39m, stone bottom; currents here, however, are strong. There is another anchorage off the NW end of Pulau Watubela, but here too the currents are strong and the holding ground poor. There is a 5.9m shoal off the NW end of Pulau Watubela. During the SE monsoon and the transition period a comparatively comfortable anchorage is off the village, **Rumah Lusi** (4˚42'S., 131˚44'E.) which is near the NE end of Pulau Tioor. Anchorage is available in depths of 55m, sand and stone bottom. There are depths of from 70 to 90m close outside this anchorage.

There is a 5m shoal extending from the N shore of Pulau Tioor.

Kepulauan Kai

4.6 Kepulauan Kai, an archipelago between the parallels of 5˚07'S, and 6˚03'S, and the meridians of 131˚55'E, and 133˚11'E may be divided into five groups, namely, Kepulauan Kur, Kepulauan Tiga Saudara (Drie Gebroeders), Kepulauan Tayandu (Tajandoe Islands), Pulau Kai Kecil (Nuhu Rowa), and Pulau Kai Besar (Nuhu Cut). The islands are formed almost entirely of coralline limestone, covered with forests and coconut trees in great abundance. Except for Pulau Kai Besar, the islands are comparatively low and most of them are encircled by extensive reefs. There are no roads on the island, but some of the villages are connected by footpaths. The inhabitants live mainly in villages along the coasts and engage in coconut culture and boat building.

Kepulauan Kur

4.7 **Kepulauan Kur** (5˚20'S., 131˚59'E.) consists of four islands, in order, from N to S, Pulau Bui, Pulau Tengah, Pulau Kaimeer, and Pulau Kur (Koer). The first three islands are on a drying reef, with Pulau Kur 7 miles farther S. The islands are all wooded.

Pulau Bui (Pulau Boei) (5˚07'S., 132˚00'E.), about 23 miles SE of Pulau Tioor and the N most island of the group, is 57m high, wooded, and uninhabited. A light is exhibited at an elevation of 15m from the N side of Bui. A shoal, with a depth of 4.9m, is about 9 miles NW of Pulau Bui and about 7.5 miles E of this shoal are two shoal patches about 1.6 miles apart with depths of 9.1m and 10.9m over them, respectively.

Pulau Tengah (5˚09'S., 132˚01'E.), on the reef connecting Pulau Bui and Pulau Kaimeer, is really a sandbar covered entirely with coconut trees. The island may be temporarily inhabited at certain seasons. Several shoal patches and reefs with depths of about 1.8m are about 0.75 mile offshore along the E coast of Pulau Tengah.

Pulau Kaimeer (5˚10'S., 132˚01'E.), composed mainly of coral lime, rises in terraces to a height of 151m; the island has a flat top, and from seaward has the appearance of a large fort. The SE side is rocky and rises steeply from the sea. There is a conspicuous small mosque about midway of the W side of the island. The island is sparsely wooded, but there are several coconut plantations on the W coast.

Pulau Kur (5˚21'S., 131˚59'E.), the southernmost of the islands of Kepulauan Kur, is a hilly island, about 5 miles long in a NE-SW direction and rises in its central part to a height of 423m. Namsar, the highest hill and in the central part of the island, appears to be very sharply pointed. Soar, a flat summit 81m high stands at the N end of the island. The land rises steeply from the sea on the N and E sides, but on the W side, where most of the villages are, the land slopes gently. The S part of the island is very uneven and the S extremity shows a broad cleft extending down to the sea. A reef with a maximum width of about 0.5 mile skirts most of the island.

A light is shown from the NE tip of the island at an elevation of 120m.

Anchorage.—During the SE monsoon medium-sized vessels can take temporary anchorage in about 70m sand, abreast the village of Nam, about 2.25 miles N of the S end of

Pulau Kur. There is an indentation in the coastal reef here that provides a good natural harbor for small craft. On the reef there are several fish dams built of blocks or coral.

Temporary anchorage may be obtained by vessels with local knowledge during the SE monsoon in an indentation on the W side of the surrounding reef between Pulau Bui and Pulau Tengah.

During the NW monsoon temporary anchorage can be taken in 70m E of the N end of Pulau Kaimeer; this anchorage is reported undesirable because of the close proximity of the coast reefs and the possibility of the anchor slipping off the steep bank.

Kepulauan Tiga Saudara

4.8 **Kepulauan Tiga Saudara** (Drie Gebroeders) is a group of three islands, the NW most which is 11.5 miles SW of Pular Kur. These islands, named Pulau Manggur (Manggoer), Pulau Wonin, and Pulau Fadol, are each surrounded by a reef but are separated from each other by passages free of dangers.

Pulau Wonin (5˚35'S., 131˚55'E.), the N most island of the group, is about 0.5 mile in diameter, is 31m high, and is covered with trees. The island is uninhabited, but there are some coconut plantations on it.

Pulau Manggur (Manggoer) (5˚35'S., 132˚00'E.), the NE most and largest of the group, is 1.25 miles long and nearly a mile wide; it is 42m high and surrounded by a drying reef extending out to a maximum of 0.45 mile. Several small villages are on the N part of the island.

Pulau Fadol (5˚40'S., 131˚56'E.), the S most of the group, is about 1 mile in diameter, 136m high, and about 5.25 miles SW of Pulau Manggur. The island is rather steep and, on the E side, can be approached fairly close; on the other sides, however, reefs project some distance from the island. There is a village on the low N end of the island. The island is a good radar target at a distance of 27 miles.

Anchorage.—The only suitable anchorage of Kepulauan Tiga Sandara is off the NW side of Manggur during the SE monsoon and off the SE side during the NW monsoon.

Kepulauan Tayandu

4.9 This group consists of three large and four small islands with a few outlying rocks. The islands are all coral formations, densely wooded, and surrounded by extensive reefs. The group extends 19 miles in a NE-SW direction and is about 8 miles wide. The S most island, **Pulau Taam** (5˚44'S., 132˚11'E.), is 134m high and round-backed. On the other islands are low hills which can be seen at a distance of 12 to 15 miles. There is some good timber on the islands.

Pulau Tayandu (Tajandoe) (5˚33'S., 132˚19'E.), 86m high, is the N most and largest of the group. Close N of Tanjung Matot, the NE extremity of the island, is Matotjanat, a small rocky islet. On the coastal reef off the NW side of the island there are several rocky inlets on some of which there are a few shrubs and trees. The N side of the island is indented by Lengiar Bay, an inlet where vessels can anchor with local knowledge. There are several shoals and reefs in the bay, however, which are hard to avoid because of discolored water. Kampung Lengiar, a village on the shore of the bay, is surrounded by a wall. **Kampung Jembro** (Yembro) (5˚32'S., 132˚19'E.), a village on the NW extremity of Pulau Tayandu, has a conspicuous mosque.

An islet, 1.8m high, lies about 1.5 miles N of Kampung Jembro. A shoal, dangerous to navigation and over which the least depth is unknown and whose position is approximate, lies about 1 mile N of this islet.

Off-lyingdDangers.—There are several dangers N and W of Pulau Tayandu. Rembang Reef, 6 miles N of Tanjung Matot, has a least depth of 11.9m; it is composed of sand and stones and is occasionally marked by discoloration. Depths of less than 14.6m lie within 1 mile N of it.

Telegraaf Reef, two shoal reefs lying close together that are seldom marked by discoloration and with a least depth of 14.6m, is 3.5 miles N of Tanjung Matot. Huisman Reef, sand and stones, with a least depth of 5.5m, is 6 miles NW of the NW extremity of Pulau Tayandu.

A 14.6m shoal is 4.5 WNW of the NW extremity of Pulau Walir, the next island S. There is also a 9.1m shoal 2.1 miles N of the NW extremity of Pulau Walir.

Caution.—There are probably other dangers within the bank of soundings in the vicinity of these islands.

The 86m summit of **Gunung Raja** (5˚32'S., 132˚19'E.) and a church tower at Kampung Ohiil, about 1.25 miles to the S, are conspicuous on the W coast of Pulau Tayandu.

The passage between Pulau Tayandu and Pulau Walir is encumbered by reefs, some of which dry, and is suitable only for small craft.

Pulau Walir (5˚37'S., 132˚18'E.), the next largest island of the group, is close SW of Pulau Tayandu and is uninhabited. Pulau Heniar (Heniaar) is on the reef E of Pulau Walir. The village of Kampung Jamtil on the island has a conspicuous mosque. Watleu is a small rocky islet on the S end of the reef S of Pulau Walir.

Pulau Waratneu (5˚35'S., 132˚17'E.) is a small island between Pulau Tayandu and Pulau Walir. A 9.1m shoal is 2.5 miles NW of Pulau Waratneu.

Anchorage.—Large vessels can anchor E or W of the line of reefs between Tayandu and Walir. In the W anchorage vessels should keep W of Pulau Waratneu. This is a good berth during the E monsoon. In the E anchorage a vessel is safe during the W monsoon S of **Tanjung Watloren** (5˚35'S., 132˚20'E.), the S point of Pulau Tayandu. To reach this anchorage steer for Pulau Waratneu on a WNW course until the last islet on the reef E of Pulau Walir disappears behind the E rocky coast of Pulau Heniar.

Pulau Ree and Pulau Reejanat are islets on a reef close W of Pulau Walir. The former is bold and 33m high; the latter is a wooded sandbank. The water area between the islets and Pulau Walir is too shallow and irregular to be used as a channel.

Pulau Nusreen (Noesreen) (5˚42'S., 132˚16'E.), Pulau Nuniai (Noeniai), and Pulau Nuwait (Noewait), on an extensive reef 2.5 miles SSW of the S end of Pulau Walir, are low and sandy; the first two are covered with coconut trees. The channels N and W of the reef on which the islands are located are about 1.25 miles wide and free of dangers.

Pulau Taam (5˚44'S., 132˚11'E.), 2.25 miles SW of the W end of Pulau Nuniai, is quite bold except at its NE extremity; it has a maximum elevation of 134m. There are numerous rocks

on the reef that encircles the island. The most noticeable of these rocks is Watfera, a large flat rock close off the W side of Pulau Taam. A conspicuous tree on the rock gives it the appearance, when seen from the N, of a ship with a single mast. A large white rock is on the reef 0.75 mile NNE of Watfera. There are two villages on the W side of Pulau Taam.

Tides—Currents.—In the vicinity of Kepulauan Tayandu the LW springs sometimes coincide, with the result that a LW level of 1.1m below mean sea level can be expected, generally around June and December. The highest HW level that can be expected is about 0.8m above mean sea level. This occurs at all semidiurnal spring tides.

Anchorage.—Vessels can anchor in 40m W of the village of Ohitoom, about 1.5 miles NW of the S point of Pulau Taam, and be sheltered against all winds except SE monsoons; this anchorage is especially uncomfortable when the winds are blowing against a S current.

Kai Kecil Group (Nuhu Rowa or Roa)

4.10 The Kai Kecil Group of islands, E of Kepulauan Tayandu, consists of two large islands and a number of small islands, all of which are generally low and are located on a bank of soundings with depths of less than 183m. The group occupies an area about 40 miles long and 20 miles wide.

Pulau Kai Kecil (Noehoe Efroean) (5˚47'S., 132˚44'E.), the central and largest island of the Kai Kecil Group, is known as Nuhu Tawun (Noehoe Tawoen) in its N part, and Nuhu Tutut (Noehoe Toetoet) in its S part. Pulau Kai Kecil is separated from Pulau Kai Dulah, the second largest island of the group and close E, by Rosenberg Strait.

Pulau Kai Kecil is about 22 miles long in a N-S direction and about 7.5 miles wide. Its outline is irregular and it is deeply indented in places. It is covered with trees and is generally low except for a few moderate hills, the highest of which is **Gelanit** (5˚39'S., 132˚41'E.), which is 3.5 miles S of the N most point of the island and is 119m high.

The N coast of Pulau Kai Kecil, between the N most point of that island and **Tanjung Ngidiun** (Ngidioen) (5˚36'S., 132˚36'E.), the NW extremity 6 miles to the W, has alternate stretches of cliffs and sandy beaches. Tanjung Ngidun is a narrow, rocky headland that rises gradually to 79m. In the middle of this coast is a large but unimportant bight the E shore of which is composed of limestone cliffs averaging 12.2m high. Fronting the coast is an extensive reef ending close W of Tanjung Ngidiun. There are a few villages along this coast.

4.11 Reefs and islands N of Pulau Kai Kecil.—Ender Reef (Karang Ender) (5˚20'S., 132˚41'E.), the N most danger of the Nuhu Efruan Group, is a sand and coral reef 1 mile long with a least depth of 5.8m; it is 6.5 miles NNW of Pulau Maas and can be distinguished by discolored water.

Batavier Reef (5˚24'S., 132˚45'E.) is 3 miles NE of Pulau Maas, and has a least depth of 4.9m. This reef is about 0.5 mile long and is reported to be marked by discolored water.

Datu Reef (Datoe Reef) (5˚25'S., 132˚43'E.), about 1 mile N of Pulau Maas, is about 1.3 miles long. The least depth is said to be 4.9m and it is marked by discolored water.

Tegal Reef (5˚29'S., 132˚49'E.), 3 miles NNE of Tanjung Serbat, the N extremity of Pulah Kai Dulah, has a least depth of 6.8m. This reef is 0.8 mile long and marked by a lighted beacon and is marked by discoloration.

Caution.—There are many other dangers in the vicinity of these reefs.

Pulau Baeer (5˚27'S., 132˚42'E.) and Pulau Maas are two islands N of the N extremity of Pulau Kai Kecil. There are numerous coconut trees on these islands. The islands are 0.33 mile apart and they are connected by a reef extending 1.75 miles E from Pulau Maas. Watlora Islet is on this reef a water 0.2 mile E of Pulau Maas. Sua (Soea) Island is nearly 1 mile SE of Pulau Maas.

Pulau Rumadan (Pulau Roemadan), nearly 3 miles NW of Tanjung Serbat, is almost divided into two parts. Detached reefs extend 3.5 miles W of the island. Pulau Dranan is a small islet about 0.75 miles S of Pulau Rumaden.

Pulau Duroa (Doe Rowa) (5˚33'S., 132˚42'E.), S of Pulau Rumadan, is the largest of the islands N of Pulau Kai Kecil. It is surrounded by a reef extending 1.5 miles W and about 0.75 mile N and S of the island. An islet is on the reef S of the island. A detached 2.7m shoal with an islet on it is close off the SE side of Pulau Duroa. This shoal is marked by a beacon. The reefs extending S of Doe Rowa and a 0.9m shoal, 1.3 miles SW of the SW side of the island are marked by a beacon and a lighted beacon, respectively. There are two villages on the NE side of the island.

Pulau Duroa is separated from the reef S of Pulau Rumadan. A shoal with a depth of 6.7m was reported in the channel, about 3.5 miles due W of Pulau Dranan.

Pulau Ut (Oet) (5˚35'S., 132˚40'E.), 2 miles SE of Pulau Duroa and 1 mile N of the N part of Pulau Kai Kecil, is a narrow, crescent-shaped islet, rocky at both ends with a low, sandy formation in the middle. A reef extends about 0.75 mile W of the islet, but it cannot always be distinguished by the color of the water. Pulau Krus (Kroes), a low, rocky islet, is on the reef close W of Pulau Ut; there is a small but conspicuous sand beach on the N side of the islet.

Selat Duroa (Doe Rowa Strait) (5˚35'S., 132˚43'E.) is the channel between Pulau Duroa and the N side of Pulau Kai Kecil. On the N side of the channel is a reef that extends W and S from Pulau Duroa, and a detached reef that is more to the S. On the S side of the channel are the islands Pulau Krus (Kroes), Pulau Ut (Oet), and Pulau Uber (Oeber), and a detached drying reef NW of the latter island. A light is exhibited from a beacon standing on a drying reef 0.5 mile NW of the NW side of Pulau Ubur. A light shows from a beacon marking a drying reef on the N side of the strait about a mile NNE of Krus. The navigable width of the channel is about 0.25 mile and the least depth of 18.3m which is found at its E end.

Tidal currents in the strait set E with the rising tide and W with the falling tide.

Caution.—Several shoals with depths of 5.8 to 16.4m are in the W approach to Selat Duroa, about 3 miles E of **Pulau Godon** (5˚34'S., 132˚35'E.).

The N end of a 7.6m bank is about 1.5 miles off the reef that extends NW from Pulau Ut and Pulau Krus. A 4.9m shoal

extends nearly 1 mile NW from Pulau Krus. A 4.2m shoal is about 1 mile NW of the N point of Pulau Ubur.

The shoals on the N side of Selat Duroa are marked by beacons. Vessels should keep about 0.32 mile S of these beacons.

4.12 West coast of Pulau Kai Kecil.—The W coast of the island is irregular and trends SSE for about 22 miles from **Tanjung Ngidiun** (Ngidioen) (5˚36'S., 132˚36'E.) to **Tanjung Doan** (5˚57'S., 132˚41'E.). This coast is generally rocky with occasional sandy beaches and is fronted by a broad reef. The coast is backed by hilly land. The villages along the coast can usually be recognized by their small churches or mosques.

The coast from Tanjung Ngidiun for 5 miles S forms a bight with shores that are alternately small sandy beaches and cliffs 9.1 to 12.2m high. There are three villages along this stretch of coast; a church is at Kampung Ngilgof, the S most. West of this village the coast bends E and forms a tongue of land on which there are two shallow coves on its E side that are closed by reefs. Beyond the E of these coves the coast trends S.

Totoad Bight (5˚43'S., 132˚39'E.) is located S of the village of Kampung Sulaer (Kampung Soelaer), where the coast forms a wide bight, narrowing to a creek which penetrates Pulau Kai Kecil in a S direction almost to its S coast. The entrance to the bight is divided into two parts, both affording good anchorage, by Pulau Wahru. In the N part, where the depths range from 10.9 to 39m, there is a small 0.5m detached reef and a long narrow reef is farther E, near the coast. The S part of the entrance has depths of 16.4 to 33m over a 0.5 mile width and is the preferred anchorage. A strong current usually sets out of the inlet. **Kampung Totoad** (5˚45'S., 132˚41'E.) has a conspicuous mosque and there is a small pier for boats. Two small islets are off the point W of the village.

Directions.—Vessels approaching the anchorage in Totoad Bight from N steer SW between Pulau Godon and Pulau Ngaf until the W end of Pulau Nai bears 180˚, then steer 180˚, passing close W of the 6.7m shoal 1.5 miles SW of Pulau Ngaf. When Gelanit Hill bears 088˚ steer for the W side of Pulau Liek bearing about 151˚. When the S end of Pulau Valtimas is in range 266˚ with the S side of Pulau Hoa, head SSE or SE. Vessels should navigate with caution due to the numerous drying reefs and shoals in these waters; pass on either side of the 3.9m shoal 2 miles SW of the S point of Pulau Uhiteer. When the N side of Pulau Tonquin bears 264˚, steer 084˚, which passes N of Pulau Liek. Then proceed to the anchorage, heading NE. Care should be taken to avoid the 0.9m shoal 0.5 mile SE of Pulau Wahru (Wahroe) and the 3.2m and 5.9m shoals 0.8 mile SW of this island.

There is a shorter route for vessels with local knowledge by passing between Tanjung Ngidiun and Pulau Ngaf, then following the coast as far as Pulau Wahru. It is essential that the reefs are plainly visible.

The approach from the S offers no difficulty. The W coast of Pulau Kai Kecil from Ngoersit, 0.5 mile W of Totoad, to Watngit, about 3.25 miles further S, has a reef extending as far as 0.75 mile offshore.

The coast between the entrance to Totoad Bight and the village of Kampung Watngit, 3.75 miles to the S, is low and sandy; between that village and **Tanjung Arat** (5˚55'S., 132˚40'E.), 6 miles farther S, it gradually increases in height. There are several villages along this coast.

4.13 Islands W of Pulau Kai Kecil.—A large number of islands and reefs are off the W coast of Pulau Kai Kecil; some of the islands are as much as 73m high. These islands and reefs extend 6 to 17 miles from Pulau Kai Kecil. The positions of these islands and reefs can best be ascertained by reference to the chart, but particulars of a few are given below.

Pulau Godon (5˚34'S., 132˚35'E.), 1.75 miles NW of Tanjung Ngidiun, is a low island about 0.5 mile long, covered with coconut trees, and with a rocky S point. It is surrounded by a reef extending about 0.5 mile to the N and SW. Pulau Er, about 1 mile W of Pulau Godon, is a low sandbank covered with coconut trees and surrounded by a reef extending 1.25 miles to the W. There is a conspicuous tree on the W side of the islet.

To the N of Pulau Er, there is a large detached drying reef, well marked by discoloration, about 0.75 mile long, the outer edge of which is 5 miles NW of Tanjung Ngidiun. A vessel has anchored on the N side of this reef in 21.9m, coral. Approach was made with the hill inside Tanjung Ngidiun in range with the summit of Pulau Godon. There is a 5m shoal 0.75 mile N of this detached reef.

Pulau Ngaf (5˚38'S., 132˚35'E.), about 2 miles SW of Tanjung Ngidiun, is surrounded by a reef extending about 0.5 mile on all sides. A shoal patch in a depth of 6.8m, is about 1.5 miles SW of the S extremity of the island; Mittilir, a 4.5m shoal, is about 3 miles to the S of the island.

An extensive reef on which there are several islets lies 7.75 miles S of Pular Er; the W edge of this reef extends nearly 1.5 miles out from its islets, and Mitfeer, a 6.7m shoal, is 3 miles SW of Pulau Nai, the 60m N islet on the reef. The other principal islets and reefs on the W side of Kai Kecil are **Uhiwa** (Oehiwa) (5˚42'S., 132˚37'E.); Uhiteer (Oehiteer), 1 mile SSE of Uhiwa; **Wahru** (Wahroe) (5˚45'S., 132˚39'E.); Hoa, 0.8 mile S of Nai; **Tonquin** (5˚47'S., 132˚34'E.); **Taroa** (5˚48'S., 132˚37'E.); **Warbalar** (5˚50'S., 132˚35'E.); and Manir, 70m high, 0.5 mile SE of Warbal.

4.14 Pulau Ur (Pulau Oer) (5˚51'S., 132˚32'E.) and Pulau Utier (Pulau Oetice), two islands, 73m and 57m high, respectively, are on a reef 8 miles W of Tanjung Arat.

Pulau Nuhu Taa (Noehoe Taa) (5˚55'S., 132˚28'E.), about 2.75 miles W of Pulau Utier, is a low sandbank surrounded by an extensive reef on the S end of which is Pulau Var, a rocky islet 25m high. A 9.1m shoal is 1.75 miles NE of the N end of Pulau Nuha Taa; a 4.9m shoal is 0.7 mile NNW of the same point; and another 9.1m shoal is 1 mile NW of that point.

Pulau Tanimbar (Kai Tanimbar) (6˚02'S., 132˚27'E.), the S most off-lying islands, is 3.25 miles long in a NE-SW direction and has a very conspicuous tree-covered summit, 54m high. Its shores are rocky and it is surrounded by a wide reef that partly dries at LW; the N side of the reef is 1.1 miles N of the W extremity of the island. Warna, a small islet, is on this reef close off the NE extremity of the island. The N side of Pulau Kai Tanimbar is deeply indented, but the cove so formed is filled with a coastal reef. Kampung Atnebar is on top of a 25m elevation at the head of the cove. A small drying boat harbor formed of coral stones is in front of the village. Shoals with a

least depth of 5.9m are located 2.1 miles N of the W end of Kai Tanimbar.

Several charted shoal spots are E, SE, and S of Pulau Tanimbar.

The island is a good radar target at a distance of 20 miles.

The various islands and groups of islands W of Pulau Kai Kecilare separated from each other by deep channels that are easily navigated when the reefs are visible. Strangers, however, will have difficulty in recognizing and identifying the different islands.

The channel between these off-lying islands and reefs and Kepulauan Tayandu to the W is clear and is 8.5 miles wide in its narrowest part.

4.15 South coast of Pulau Kai Kecil.—From Tanjung Arat (5˚55'S., 132˚39'E.) the coast trends E and S for 4.5 miles to **Tanjung Doan** (5˚57'S., 132˚41'E.) forming a semicircular bight about 1.75 miles in diameter. Tanjung Arat, the SW extremity of Pulau Kai Kecil, although not very high, is backed by a hill which attains an elevation of 107m 1 mile NE of the point. Tanjung Doan, slightly higher than Tanjung Arat, may be identified by its orange colored rocks and by the 60m hill standing 1 mile N and by Noiko Islet, 0.65 mile S of the point. Between Tanjung Doan and **Tanjung Muslenar** (Moeslenar) (5˚57'S., 132˚43'E.), a rocky point 1.75 miles to the E, the coast recedes sharply forming the inlet Teluk Uf (Oef). From Tanjung Muslenar the coast trends ENE for a distance of 3 miles to **Tanjung Hoar** (5˚57'S., 132˚46'E.), a somewhat low but rocky point. This stretch of coast curves in slightly but is fronted by a drying reef that is nearly 0.5 mile wide.

Mitroa Reef (6˚00'S., 132˚43'E.), with a least depth of 4.9m, is 3 miles S of Tanjung Muslenar; the reef discolors slightly.

Shoal patches from 1.8 to 7.6m are between Mitroa Reef and Tanjung Muslenar.

Anchorage.—Anchorage can be taken in the bight between Tanjung Arat and Tanjung Doan opposite the village of Kampung Ohoideer Tutut, which may be recognized by a small church. Anchorage can also be taken in Teluk Uf, described below.

Teluk Uf is a rectangular inlet about 3.5 miles long and 0.5 to 1 mile wide and with general depths of 1.8 to 11.9m. Vessels entering the inlet should proceed in on a course of 000˚ passing about 0.5 mile W of Tanjung Muslenar, in order to avoid three shoals with depths of 4.1, 4.9, and 5.8m, respectively, NE of Noiko. Anchorage, sheltered against both monsoons, can be taken in the bight in depths of 9.1 to 11.9m, sand.

4.16 East coast of Pulau Kai Kecil.—The E side of Pulau Kai Kecil from Tanjung Hoar to Rosenberg Strait, 13 miles to the N, is low and the inland hills afford no landmarks. Pulau Daar and Pulau Bararan, parallel to each other close off the N part of this coast, can scarcely be distinguished from the mainland coast itself. N of Kampung Abean, 5.5 miles NNE of Tanjung Hoar, the soundings inside the 200m curve are very irregular and the water is discolored. Parallel to and 1.5 miles E of Pulau Daar is a sandy reef. Shallow waters with depths of 1.8m and 2.7m extend up to 0.9 mile S of this reef. A reef with a depth of 0.5m is 2.25 miles S of the sandy reef. Two miles farther S is another reef with a least depth of 4.9m. There is a reef and rock dangerous to navigation about 2 miles E of Tanjung Vadsit.

There are numerous unimportant villages along this coast.

Rosenberg Strait (5˚42'S., 132˚45'E.), separating the SW side of Pulau Kai Dulah from the NE side of Pulau Kai Kecil, is a winding channel 1.5 miles wide at its E end decreasing to about 91m at its NW end. Because of reefs extending out from the shores, the channel is very tortuous. Branching off from each side of the strait are several arms with irregular depths. Because the depth at its NW end is not more than 1.8m, the strait has no navigational importance as a channel. A wooden bridge spans the NW end of the strait about 0.5 mile S of Tual (Toeal).

4.17 Northeast coast of Pulau Kai Kecil.—From the NW end of Rosenberg Strait to the N most point of the island the coast of Pulau Kai Kecil is very irregular and is fronted by several islands including Pulau Fair, Pulau Kran, and Pulau Ubur (Oeboer). A broad reef skirts this coast and connects these islands with the shore.

Teluk Gelanit (5˚38'S., 132˚41'E.) is an inner bay separated from Tual Roads by Pulau Fair. It consists of two basins with depths between 9.1m and 23.8m connected by a bar with a least depth of 1.8m. The entrance, S of Fair, has a narrow and tortuous entrance with a depth of 5.5m and its use is limited to small craft only. Four mooring buoys are moored close to the S side of the entrance opposite the S extremity of Pulau Fair.

Pulau Kai Dulah (5˚37'S., 132˚46'E.), the second largest island of the Kepulauan Kai Kecil group, is close off the NE side of Pulau Kai Kecil. The S part of the island is higher than the N. The highest hill, located on the W side of the island, is 115m high. Tanjung Vadsit, the S extremity of the island, is a steep point, 11.9m high. **Kampung Naam** (5˚33'S., 132˚48'E.) is on the sandy NE extremity of the island. Tanjung Serbat, the N extremity of the island, is low and sandy. Kampung Tual and Kampung Dulah, the most important villages, are on the W side of the island and are mentioned below.

There are several reefs within the 200m curve along the E coast of Pulau Kai Dulah.

Tual Roads (5˚38'S., 132˚44'E.) is within the limits of a line drawn in a 225˚ direction from the point W of Kampung Dumar to Pulau Fair, and on a line drawn in a 045˚ direction from the SE extremity of Pulau Fair to the shore S of Kampung Tual.

Vessels approaching the roads from NE may have difficulty in making out the entrance to the channel to the roads. Among the useful landmarks in the vicinity are: Gelanit Hill, 3.5 miles S of the N extremity of Pulau Kai Kecil; the E extremity of Pulau Duroa; Kran Islet, close S of Pulau Ubur; and **Lobi Islet** (5˚35'S., 132˚45'E.), close off the W side of Pulau Kai Dulah. The W coast of Pulau Kai Dulah S of Kampung Dulau is distinguished by several fairly high hills.

Winds—Weather.—In November the NW monsoon sets in; during December the winds blow predominantly from the W and NW with an average velocity of 6 knots, but winds of very considerable force are not uncommon. Calms are frequent between November and January. In April the monsoon changes and the direction of the prevailing winds shifts to E and SE, with those from the SE predominating until October.

Thunderstorms are most frequent at the change of the monsoon.

There is greater precipitation among the Kepulauan Kai group and Kepulaun Tanimbar group than on Timor to the W. This condition is caused by SE winds that blow from the Pacific through Torres Strait.

Tides—Currents.—At Kampung Tual the highest water level occurs in March or April and the lowest occur in July, August, and September. The maximum rise and fall that can be expected are, respectively, about 2.5m above and 0.2m below mean sea level.

Little is known about the currents in this group of islands, except that in Selat Duroa an E current has been noted during the flood and a W current during the ebb; maximum recorded velocity was 2 knots.

Anchorage.—A safe anchorage may be obtained in Tual Roads in depths of 20.1 to 24m. Anchorage may also be obtained during the SE monsoon off Kampung Dulah, but heavy swells occur here during the NW monsoon.

Small craft use a small shallow inlet in Kai Dulah, abreast the village of Tual. There is a small pier in the inlet.

Directions.—Approaching Tual Roads from N steer 180˚ for Tanjung Serbat which leads about 1.25 miles W of Tegal Reef, described in paragraph 4.11. When Lobi Islet, close off Tanjung Lobi, about 4.25 miles SW of Tanjung Serbat, bears 210˚, steer for it on that bearing until abeam of Kampung Dulah, then steer for the sandy patch on the NE point of Pulau Ubur bearing 246˚. When the beacon 0.5 mile SE of the SE point of Ubur bears 180˚; alter course to pass W of this beacon between it and the reefs and shoals extending from the SE shore of Ubur. The vessel can be guided by the beacons to the roadstead, but care must be taken to avoid the shoals in the approach to and within the roadstead.

To enter Tual Roads from NW through Selat Duroa, set course for Tanjung Nigidiun from a position about 10 miles N of that point. From this position Pulau Tayandu, Pulau Er, and Tanjung Ngidiun are good landmarks. Pulau Er is easily distinguished from the other islands because it is lower and less overgrown. Course 180˚ should be steered toward Tanjung Ngidiun until the N end of Pulau Godon is nearly abeam. Then steer E, keeping the NW end of Pulau Er astern and open N of Pulau Godon. Pass between the 5.6m and 8.1m shoals lying 3 miles E of Godon. These dangers are best located by reference to the chart. When the two beacons marking the N side of Selat Duroa bear 094˚, steer into the strait, favoring the N side of the channel. Reference should be made to the chart as the reefs extend about 0.6 to 1.0 mile from the S shore of Doe Rowa and a 4.1m reef is 0.6 mile SSE of Muha Nuhu Janat (Moeha Noehoe Janat). Local knowledge is necessary. When Muha **Nuhu Janat** (5˚33'S., 132˚43'E.) bears 000˚ steer around the N side of Pulau Ubur. Then proceed as directed for the N approach above for Tual Roads. The unmarked dangers along this route are best shown on the chart.

Caution.—A 5.5m bank extends about 0.75 mile N and 0.5 mile W from **Tanjung Serbat** (5˚31'S., 132˚48'E.), the N extremity of Pulau Kai Dulah. There are shoal patches with depths of 10m, 6.9m and 7.8m, 1.2 miles NW, 2.0 miles W, and 1.3 miles W of Tanjung Serbat respectively. There is a beacon on the S end of the 6.9m shoal.

A detached reef with a least depth of 0.9m, is about 0.5 mile ESE of the SE extremity of Pulau Ubur and is marked by a beacon.

A shoal, with a depth of 7m, lies in the center of the fairway, 0.4 mile E of the SE end of Pulau Ubur.

A narrow reef, about 0.5 mile long in a N-S direction and with a depth of 0.9m, is 1 mile S of the SE extremity of Pulau Ubur. This reef is marked by beacons, but they may be missing.

A reef projects N about 183m from the point of land W of Kampung Tual.

Kampung Tual (5˚38'S., 132˚44'E.) (World Port Index No. 52800), the principal village of the Kepulauan Kai Kecil group, is headquarters of a governmental official. Located in the S part of the W side of Pulau Kai Dulah, it is partly on the beach and partly on the slopes of the hills that back the coast. Kai Dulah Tual Light is exhibited on the shore close W of the village on a white metal framework tower. Provisions can be obtained here. There is a boat pier with a flagstaff and a hospital. There is also a hospital in Selat Rosenberg, 1.5 miles to the S.

It was reported that a T-head pier at the village had a length of 35m, with depths of 5m at the outer berth and 2m at the inner berth.

Pulau Kai Besar (Noehoe Tjoet)

4.18 Pulau Kai Besar (5˚40'S., 133˚00'E.), the E most of the Kepulauan Kai group 4 to 13 miles E of the Kepulauan Kai Kecil group, is about 50 miles long in a NNE-SSW direction and a width varying from 1 to 5.25 miles except at the S end where there is a tongue of relatively low land about 3.5 miles long and 0.5 mile wide. The mountainous aspect of this island distinguishes it sharply from the comparatively low islands of the Kepulauan Kai Kecil group. The entire island is wooded but there are patches of cultivation in places along the slopes of the hills. The coast is high and bold, but there are occasional sandy beaches with villages. The coasts of the island are principally projecting points, offshoots of the mountains and hills.

A chain of mountains extends along the middle of the island for almost its entire length. The mountains are well wooded and can be sighted for a considerable distance except when their summits are enveloped by clouds, which is generally the case of those mountains with elevations greater than 396m.

The principal mountains from S to N are **Morbait** (5˚52'S., 132˚56'E.), 521m high; Wirmangle, 454m high; Nonaibal, 575m high; and Advilnas, 380m high. These four mountains are peaks of a generally steep mountain range extending N from the S end of the island; for a considerable distance N of Advilnas, however, this range consists of hilly ridges with inconspicuous peaks.

Close SW of that section of the island that is narrowed by **Teluk Elat** (5˚38'S., 133˚00'E.), is Warhuk, 554m high, which is conspicuous because it resembles the back of an elephant with its head facing S. Sicek (Sitjek), 455m high and 2 miles NE of Warhuk, has the shape of a truncated cone. Fakoi, 619m high and 2 miles NE of Sicek, rises almost vertically on the SE side and has many light-yellow-colored stone sections.

Gunung Daab (5˚35'S., 133˚04'E.), the highest peak on the island, 800m high and about 3 miles NNE of Fakoi, has a cone

shape, but it is usually enveloped in clouds. Triple Top, 590m high and about 7.5 miles NNE of Gunung Daab, has three equally high peaks that appear as a slightly waving line when seen from seaward. Boo, 793m high and about 3 miles N of Triple Top, has a notched top that slopes to the S. Kaar, 742m high and about 2 miles N of Boo, has a rather pointed top. N of Kaar, there are several peaks, the highest of which, Wokra, is 688m high, but they stand so close together that they are of little use as landmarks.

Winds—Weather.—The coasts of Pulau Kai Besar are subject to violent squalls which sweep down from the mountains on to the E coast during the NW monsoon and on to the W coast during the SE monsoon. These squalls are dangerous to small craft and even call for caution on larger vessels, especially when at anchor. On the E coast such squalls are particularly strong in the vicinity of Fakoi, near the center of the coast, on the W coast they are strongest at the S end of the island, between **Nerong** (5˚47'S., 132˚56'E.) and **Fer** (5˚57'S., 132˚51'E.). During the period of change between the monsoons, in the months of October/November and March/April, the winds are not especially strong and temporary anchorage can be obtained anywhere along the E coast. Local knowledge is necessary. The Dutch referred to such bora-like winds as "Valwinden".

4.19 East coast of Pulau Kai Besar.—The E coast of the island is so steep-to that a vessel can proceed quite closely along the shore. The most conspicuous points along this coast are **Tanjung Weduar** (Wedoear) (6˚01'S., 132˚50'E.), the steep S extremity of the island; Tanjung Obahan, a rocky point 11.75 miles NNE of Tanjung Weduar; and Tanjung Wahadan, 15 miles farther NNE. The latter point is not particularly high, but it is rocky and the mountains immediately behind it rise steeply.

Tanjung Weduar is a good radar target at a distance of 25 miles.

Anchorage.—In as much as the E coast of the island is steep-to and subject to winds during the monsoons (described above), it affords no good anchorage at these times. During the change periods from the NW to SE monsoons, however, when there are no such winds, vessel may anchor in depths of 46 to 73m, sand and stones, close to the shore.

During the NW monsoon anchorage can be taken at the following places:

Weduar (Wedoear) **Roads** (5˚50'S., 132˚56'E.), is an indentation in the coast 2 miles NW of Tanjung Obahan. A conspicuous house is on the shore of the bight close S of Kampung Weduar. The preferred anchorage is in a depth of 29 to 40m with the conspicuous house bearing 235˚. An 8.8m shoal, not marked by discoloration, lies about 0.3 mile SE of the village.

Kampung Ohoiwait (5˚45'S., 132˚57'E.), about 4.5 miles N of Kampung Weduar is on a high, steep, conspicuous hill. In the middle of the village is a sacred spot called "Woma" which is surrounded by a low brick wall.

Kampung Jamtimur (Jamtimoeri) (5˚36'S., 133˚06'E.), has a small but conspicuous church. Kampung Kilwaer, 1.5 miles NNE of Kampung Jamtimur, can easily be recognized by a flagstaff at the village.

Small craft can find good anchorage in an indentation in the coastal reef off the village of **Kampung Hollat** (5˚30'S., 133˚08'E.). The two churches in the village are good landmarks. The Roman Catholic Church, without a tower, stands close N of the highest point of the built-up area; the spire of the Protestant Reformed Church stands 0.25 mile N of it.

Vessels approaching the village should steer 276˚ for the southernmost church, which leads through the opening in the reef. Then anchor in 5.8m about 0.15 mile off the reef with Tanjung Nuwahan (Noewahan), 4 miles SSW, bearing 196˚. The reefs are fairly well marked by discoloration. Copra is exported but cargo transfer from lighters is only possible during the NW monsoon.

Kampung Bandan Eli (3˚25'S., 133˚09'E.), 4 miles S of Tanjung Ngarmin, may be recognized by its conspicuous mosque and a large number of dark red-roofed buildings. This village is concealed from vessels coming from the S by Tanjung Kawas, a high rocky point with a small rounded summit, about 3 miles S of the village.

Ur Roads (Oer Roads) (5˚22'S., 133˚10'E.) is a small inlet 5.5 miles S of the N end of the island. The Wer Ur, a small stream emptying into the inlet, flows through the valley across which Watnus, a sharp peak, 617m high, can be seen on a clear day. This peak in line with the center of the valley leads to the anchorage. In case of poor visibility, vessels can approach on a WNW or NW course by steering for a wooden bridge that crosses the Wer Ur just N of the village. The preferred anchorage is near the reef in a depth of about 55m, sand, 0.25 mile offshore.

4.20 The N coast of Pulau Kai Besar is lower than the E coast, but it is characterized by spurs of the mountains that project out from the shore. **Tanjung Borang** (5˚17'S., 133˚09'E.), the N most point of the island, is the most important landmark on this coast. It is usually the first point of land to be sighted by vessels approaching Kepulauan Kei from the N. An unexploded ordnance is reported to be about 3.25 miles NE of Tanjung Borang. The mountains to the S of the point are usually enveloped in clouds. Between Tanjung Oratu (Oratoe), the NE extremity of the island, and Tanjung Borang the coast is generally rocky although there are a few sandy beaches. This area within the 10m curve, which extends out nearly 1 mile, is decidedly foul. On the shore 0.5 mile NW of Tanjung Oratu there is a conspicuous sandy spot.

Labuan Dabu (Laboean Daboe) (5˚17'S., 133˚09'E.), just SE of Tanjung Borang, is a channel in the coastal reef. A 5.8m shoal is in the approach at the N end of the channel. Good anchorage is available with local knowledge in depths of 7.3 to 14.6m.

Teluk Hoh (5˚17'S., 133˚09'E.), between Tanjung Borang and Tanjung Vorwahan, is an elongated indentation of the coast that penetrates the coast for about 0.75 mile. The navigable width of the bay is only about 137m. The bay is fronted by a bar with a least known depth of 7m. Anchorage is available with local knowledge in depths of 9.1 to 11.9m, sand, at all seasons. Proceed to anchorage passing along the Tanjung Borang side of the bay at a distance of about 183m offshore. A number of houses built on piles on the W side of the bay are seasonally occupied.

Teluk Wair (5˚17'S., 133˚08'E.), between Tanjung Borang and Tanjung Patingru (Patingroe), the NW extremity of the island and about 9.1m high, affords safe anchorage to vessels with local knowledge during the SE monsoon in a depth about 40m at a moderate distance offshore. Kampung Wair is at the head of the bay. The shore is rocky and steep except at the head of the bay.

4.21 The W coast of Pulau Kai Besar has a wider coastal reef than the E coast and, therefore, affords better anchorage. The shore is sufficiently steep-to to enable vessels to come rather close inshore. **Teluk Elat** (5˚38'S., 132˚59'E.), about midway along this coast is, from a navigational standpoint, the most important place on the island.

Tanjung Patingru (Patingroe) (5˚17'S., 133˚07'E.) is a rocky cape, about 9.1m high, consisting of a mountain spur. Niv Rock, close N of the cape, is an aid in identification. From Tanjung Patingru to the village of **Kampung Hor** (5˚21'S., 133˚05'E.), 4.5 miles to the SSW, the coast is fairly high and characterized by gray rock with many white dots. Woho, a mountain 4 miles S of Tanjung Patingu rises almost vertically to a height of 566m. S of this mountain the land slopes gradually toward the middle of the island, but the coast continues rocky with a few conspicuous points among which are **Tanjung Ohiserkum** (5˚23'S., 133˚04'E.) and Tanjung Hebri, about 4 miles farther S. South of the latter point the mountains are farther from the coast.

There are more villages on the W than on the E coast of the island. They are easily recognized and some have conspicuous white mosques.

Anchorage may be obtained anywhere along this coast N of Teluk Elat during the SE monsoon in depths of 44m; there are, however, heavy squalls during that period.

Off-lying dangers.—Several detached steep-to dangers are off the coast between Tanjung Hebri and the entrance to Teluk Elat. The channel between these dangers and the coast is deep and clear.

Mituwat (Mitoewat) (5˚30'S., 133˚01'E.), the N most of the dangers, is about 1 mile long and 0.75 mile wide; it partly dries but is completely covered one hour before HW.

Mitduan (Mitdoean) (5˚31'S., 133˚00'E.), a rocky shoal close S of Mituwat, is about 1.75 miles long and partly uncovers.

A 2.7m shoal is 1.25 miles S of the S end of Mitduan and 2.5 miles NW of **Tanjung Jarleie**r (5˚36'S., 133˚01'E.).

Mitnaloa (4˚36'S., 133˚01'E.), a crescent-shaped reef about 1 mile long, is abreast of Tanjung Jarleier. The S part of this reef is awash at HW. The reef is in the approach to Teluk Elat. An 11.9m shoal is close N, and a depth of 9.6m is 0.5 mile SW, respectively, from Mitnaloa.

4.22 Teluk Elat (5˚38'S., 132˚59'E.), about midway along the W coast of Pulau Kei Besar, is a roughly circular inlet with a diameter of about 1.5 miles. Close to the E side of the bay are two small islets, Nuhu Ru and Krad, connected by a reef that projects from the shore of the bay. Farther S is the larger Sfat Islet, which is surrounded by an extensive reef and is connected with the S shore of the bay by a shore bank. Close off the W entrance point is the much larger Nuhu (Noehoe) Jaan island, 20m high. A beacon stands about 0.15 mile off the NE point of Nuhu Jaan and a 9.4m shoal lies about 1 mile NNW of the same point; another beacon stands midway along the E side of Nuhu Jaan. In the bay itself there are several rocky patches, but some are marked and entrance into the bay is not difficult.

Tides—Currents.—At Teluk Elat the highest water level occurs in February and March, the lowest in July, August, and September. The maximum rise and fall that can be expected are, respectively, about 2.5m above and 0.2m below mean sea level.

Aspect.—The principal landmarks in the area are Warhuk (Warhoek) and Sicek (Sitjek), mountains that have been previously described, and a light green hill on Sfat Islet that can be seen for a considerable distance from seaward. There are numerous coconut trees in the vicinity of the bay.

It should be noted that foul ground extends about 0.15 mile outside the beacon NE of Nuhu Jaan and a 4m patch lies about 1 mile ESE of the N end of Nuhu Jaan. This patch is marked by a black beacon. The inner black beacon on the W edge of the reef is about 0.15 mile from the W extremity of Sfat islet. The topmark is reported missing on this beacon. A 5.9m shoal extends about 0.6 mile from the S end of Nuhu Jaan and should be noted when entering Elat Bay.

The passage between the S end of Nuhu Yaan and the main island is only for small boats with local knowledge.

Anchorage.—Teluk Elat affords anchorage in all seasons of the year. During the SE monsoon the best anchorage is in a depth of about 26m, sand, W of the pier at Kampung Banda Elat. During the NW monsoon the preferred anchorage is in a depth of 24 to 29m, sand and coral, W of Nuhu Yaan island, with Kampung Raharin, which is close SW of Kampung Elat bearing about S.

Directions.—Vessels approaching Teluk Elat from the N should sight the light green hill on Sfat Islet and steer for it until the beacons are identified. Once the aids are identified there should be no difficulty in proceeding to either of the anchorages.

4.23 Kampung Banda Elat (5˚39'S., 132˚59'E.), on the S shore of Teluk Elat, is the most important village of Pulau Kai Besar and is the center for the exportation of copra. A 302m long stone pier projects out to a depth of 4.9m close NW of the village. A red-roofed shed is on the pier. Another small pier with a flagpole at its root and E of the stone pier is reported to be in disrepair. A light is exhibited from a structure in the village. Good drinking water and provisions can be obtained here. The large village of Kampung Butun (Boetoen) is close E of the village.

Between Teluk Elat and **Kampung Werka** (5˚42'S., 132˚57'E.), 3.75 miles to the SSW, the coast is rocky cliffs that have a sheer rise from the sea to a height of about 21.3m. Tanjung Laer Mayoran, 2.75 miles SW of Teluk Elat, can be recognized by a waterfall that plunges directly into the sea. A 0.5m shoal lies 0.5 mile off the coast abreast of Kampung Watoear. The coast from Kampung Werka to Kampung Larat, 6.5 miles SSW, is low and gently sloping. A reef which breaks, with a 1.8m patch close N, is 3.5 miles N from Kampung Larat and about 1.5 miles offshore. There is a 18.3m patch about 1 mile N of this reef. Abreast of Kampung Nerong, 5 miles S of

Kampung Werka, is a small inlet suitable only for small craft. The point at Kampung Larat is easily recognized by Aran, a rock fringed by a drying reef. There are several charted shoal spots along this stretch of coast.

The coast between Kampung Larat and Kampung Fer trends SSW for 9.25 miles with several indentations, the largest of which is 5.5 miles SSW of Kampung Larat. The most prominent marks along this part of the coast are: a conspicuous white rock close to the shore 2.25 miles SW of Kampung Larat; Kampung Hoiko, on the shore of a small inlet whose sides rise almost vertically from the sea; Duvin (Doefin) Islet, on the shore Duvin Islet reef close SW of Kampung Hoiko; and rocky Rerean Islet, on a reef 4 miles S of Duvin Islet. Very heavy squalls are experienced along this stretch of coast during the SE monsoon.

4.24 Fer Roads (5˚57'S., 132˚51'E.) is an open anchorage 3.75 miles NNE of the S tip of Pulau Kai Besar. On the N side of the anchorage is a white sandy shore bank that remains dry at all stages of the tide. From this bank a tongue with a least depth of 2.1m extends S about 0.35 mile forming within the shore bank a bight 0.2 mile wide with depths of 10 to 29m. Vessels should approach the anchorage with the mosque in Kampung Fer bearing between E and SEand anchor in any depth on that bearing.

Kampung Fer is built on two terraces on a slope overlooking the roadstead. Kampung Langgear, surrounded by coconut trees and with a conspicuous mosque, is on the beach about 0.5 mile S of Kampung Fer.

Tanjung Weduar (6˚01'S., 132˚50'E.), the S extremity of Pulau Kai Besar, consists of vertical cliffs about 52m high.

Selat Nerong, the strait between the Pulau KaiKecil group and Pulau Kai Besar, is deep and clear with no difficulties to navigation. The least width of the strait, 4 miles, is between the villages of Kampung Abean on Pulau Kai Kecil and Kampung Hoiko on Pulau Kai Besar. Approaching from S or SW the high land of Nuhu Cut will first be sighted, resembling two coffins; a very large one being formed by mountains and hills between the village of Fer, 4 miles NNE of Tanjung Weduar, the S steep point of the island and the mountains 8 miles NNE. Nothing is known of the currents in the strait, but it is presumed that they are very weak.

Kepulauan Aru

4.25 Kepulauan Aru (6˚10'S., 134˚30'E.), about 65 miles E of Pulau Kai Besar and about the same distance SW of the nearest coast of New Guinea, are generally low and very uniformly wooded. The group consists of five large islands, separated by very narrow and shallow channels, and numerous smaller islands. The larger islands are Pulau Kola, Pulau Wokum, Pulau Kobroor, Pulau Maikoor, Pulau Koba, and Pulau Trangan. The smaller islands are grouped around these five; most of them are connected to the principal islands by reefs, but some are connected by navigable channels. The highest elevations in the group, 89m and 73m, are located, respectively, near the S end of Pulau Trangan and on Pulau Karawair-Besar (Great Karawaira Island), which is E of the N end of Pulau Kobroor.

The reefs can generally be safely approached on soundings. Since the water in their vicinity is not clear the reefs are generally not marked by discoloration. Between the reefs there are passages through which small craft can reach the villages and the rivers and channels that separate the principal islands. It is not possible to place a definite limit on the danger zone around these islands, but is it not advisable to approach within the 20m curve.

There is little uniformity in the names given by the natives to the various islands, points, and channels of this group; some places are known by as many as six or seven different names.

These islands are generally very sparsely settled. The population in general is on the E side of the principal islands. Although there are many different tongues and dialects on the islands, Malayan is generally understood.

Most of the villages on the E coast are built on cliffs and can be reached only by means of flights of steps. The principal occupations on the islands are agriculture, hunting, fishing and pearl diving. Dobo, located on the NW side of Pulau Wamar, one of the smaller islands on the NE side of the group, is the only port of any importance in the group and all trade is concentrated there.

Tides—Currents.—The tide at the village of Dobo will be discussed later. HW occurs simultaneously on opposite sides of this group of islands in places of the same latitude, but the time of the HW becomes progressively later from N to S. HW at the S end of the group is two hours later than at Dobo. Throughout the group the amount of rise and fall of tide is about the same as at Dobo.

Tidal currents are perceptible 15 to 20 miles from Kepulauan Aru. In the open sea the flood current sets to the E and the ebb to the W; the maximum drift is about 2 knots. The flood and ebb currents, respectively, become established one to two hours after the H and LW at the shore.

Along the W side of the group the flood current sets S and the ebb N, with a maximum drift of 1.5 knots. The duration of the ebb current is considerably longer than that of the flood. In the mouths of the narrow channels between the islands there is a very strong ebb current lasting practically as long as that tide, followed by a strong in-going stream during a few hours with the rising tide. The same condition exists at Dobo Roads, except that there is a brief period of slack water.

The flood current sets SE and E around the S end of the group. Off Tanjung Ngaburoamlu the S extremity of the group, this current has a maximum drift of three knots.

Along the N side of the group the flood current sets SE at a rate of about 2.5 knots as far as Kepulauan Jedan (Djedan Eilanden) where it turns SSE and continues in that direction along the E side of Pulau Wokam and Pulau Kobroor to Pulau Mariri, about midway along the E side of Pulau Kobroor. At that position it meets the flood current that sets ENE from the S end of the group. Turning with that current it sets back N along the E coast. At the junction of these two currents a rotary movement is set up, toward the shore when the tide is rising and away from the shore on the falling tide. North of the N end of **Pulau Penambulai** (6˚17'S., 134˚52'E.) the ebb current sets NNE and N as far as **Pulau Konan** (5˚34'S., 134˚46'E.), a small islet 44 miles to the N, where it turns to the NNW. North of Kepulauan Jedan its direction is NW by N. South of the N end of Pulau Penambulai the ebb current follows the line of

offshore reefs to the S. Off the entrances to the channels separating the islands the current is deflected to the SE and S.

Off the E coast the direction of the tidal currents is considerably affected by the currents that set through the channels separating the islands. The currents setting out of these channels exert much more influence on the coastal currents than do those setting into the channels.

Heavy rips caused by the irregularity of the bottom and giving the impression of the existance of dangerous shoals have been observed at the height of the tidal currents off the N and S ends of the group, particularly SW of **Kultubai Selatan** (Koetoelbai Zuid) (6˚52'S., 134˚43'E.) and the S and W extremity of Pulau Jeudin (Djoeedin).

Caution.—A reef of indefinite size has been reported S of Kepulauan Aru within a 5 mile radius of 8˚33'S, 134˚26'E. This reef is unexamined.

A bank with a depth of 22m has been reported about 36 miles SW of Tanjung Ngabordamlu, the S most extremity of Kepulauan Aru, and a bank with depths of less than 37m extends about 33 miles SSE and 36 miles ESE from the same point. A depth of 31m is close to the S extremity of this bank. Another bank with depths of less than 37m extends E from the E side of Kepulauan Aru, but the E limit of this bank has not been defined. A least charted depth of 20.1m is about 105 miles ENE of Tanjung Ngaboradamlu in 6˚44.0'S, 135˚54.0'E. A detached bank with a depth of 29m is in 7˚28'S, 136˚17'E, about 49 miles SSE of this last depth. An incomplete survey showed depths between 9.1m and 20m within a 14 mile radius of 8˚24'S, 135˚45'E. **Kolff Bank** (7˚00'S., 136˚51'E.) has a least depth of 14.6m; **Le Chur Bank** (8˚30'S., 136˚15'E.) has a least depth of 24m.

A 6.4m shoal and a 9.1m shoal lie 34 miles WSW and 46 miles WNW, respectively, from Tanjung Ngabordamlu.

4.26 North side of Kepulauan Aru.—Pulau Warilau (Warilaoe) (5˚22'S., 134˚32'E.) the largest island N of Pulau Kola, is uniformly covered with tall trees. A small village of the same name is on the SW side of the island. The island has been reported to be a good radar target at a distance of 19 miles. A light is shown from the N most tip of the island. Pulau Toba, a small islet with an extensive reef extending from its N, W, and SW sides, is 1.5 miles W of Pulau Warilau and is covered with tall trees. Ngoba is a small crescent-shaped islet on a wide reef extending NW from Pulau Warilau, its trees are not as high as those of Pulau Toba. A detached reef with a small grass-covered islet is between Pulau Toba and Ngoba. Another detached reef with a similar grass-covered islet is 1.2 miles NNE of **Tanjung Watulaijuring** (Watoeleidjoering) (5˚20'S., 134˚34'E.) the N extremity of Pulau Warilau. A sandbank that covers at HW is on the shore bank E of Pulau Warilau and NW of Kepulauan Jedan.

Kepulauan Jedan (Djedan Eilanden) (5˚23'S., 134˚40'E.), consists of a group of uninhabited islands, the larger of which are low but well wooded. **Pulau Jedan** (5˚23'S., 134˚41'E.), the N most island of the group, is the most important landmark in this part of Kepulauan Aru. The trees on this island are about 51m high. In daytime the island can be seen at a distance of 13 miles. The reefs on which these islands lie are intersected by several tortuous channels through which the tidal currents are strong when the reefs begin to uncover. Pulau Lutur (Loetoer), 1.25 miles SW of Pulau Jedan, has a small summit that is slightly above the surrounding foliage. Santigi, a group of five low mangrove-covered islets, are on the reef that extends E from Pulau Lutur (Loetoer). Surat (Soerat) Islet, a small atoll-shaped sandbank, is on an extensive reef S of Pulau Jedan. Pulau Belading, the largest island of this group is close W of Pulau Lutur; a narrow channel separates the reefs on which these last two islands lie.

A dangerous sunken rock is at 5˚17'S, 134˚45'E about 6.75 miles NE of Pulau Jedan, outside of the 20m curve, and a reported depth of 5.5m is about 3.8 miles W of this rock. There is a shallow spot with a least depth of 5.9m, outside the 20m curve, 4.5 miles WNW of Toba Island.

A group of eight or nine rock islets densely covered with vegetation are SE of Pulau Warilau; the southernmost is named Tapusur (Tapoesoer).

4.27 Watoe (5˚24'S., 134˚28'E.), a deep Sungi Kola Watoe channel in which there are no dangers, is between Pulau Warilau and the N side of Pulau Kola, the N most of the principal islands of the group. The reefs on either side are generally marked by discoloration. The Tiga Islets are three high, thickly-wooded islets on the shore of this channel close off Pulau Kola. Klipklip Watu is a small, unsurveyed channel that leads from N close along the SE shore of Pulau Warilau into Sungi Kola Watu. The E approach to Sungi Kola Watu is either N or S of Tapusur, but the S channel is suitable only for small craft. The N part of this channel has not been completely surveyed. In the N channel there are general depths of 4.1 to 17.8m, but there is a 3.9m shoal in mid-channel about 0.8 mile S of the SE end of Pulau Belading. The edges of the reefs along this channel are generally marked by discoloration. The channel leads NW to a point abreast the W end of Pulau Belading and then SSW along the E shore of Pulau Lafusa, an islet about 0.8 mile W of Tapusur. This part of the channel, in which there is a least midchannel depth of 6.8m, joins Sungi Kola Watu SW of Pulau Lafusa. Local knowledge is necessary.

4.28 West side of Kepulauan Aru.—Except for the S part of Pulau Trangan, which is hilly and has a sheer rise from the sea, the W side of the islands of Kepulauan Aru are low and uniformly covered with dense woods. There are no landmarks that can be used to fix the position of a vessel along this coast. The mouths of the various rivers and channels and the more or less protruding section of the islands are of use to vessels passing close along the shore. Inside the 10m curve there are numerous reefs. The bottom along this coast is regular, except along the S part where soundings can be used as a guide. Vessels can anchor outside the 10m curve in sand almost anywhere along this coast.

Pulau Kola (5˚28'S., 134˚33'E.), the N most of the main islands of Kepulauan Aru, is low and densely wooded. Sungi Kola Watu, previously discussed, separates Pulau Kola from Pulau Warilau. The island is intersected by several channels and creeks of various depths. The two largest channels are Sungi Marjina which opens into the E part of Sungi Kola Watu, and Sungi Marlassi, which is entered on the E side of the island. Sungi Sisirwatu, which limits the S side of Pulau Kola and separates it from Pulau Wokam is said to be suitable only

for small craft. Tidal currents rush through the channel with great force. At its W end the channel is narrow and tortuous and has formed a sort of delta on which there are numerous islets and drying flats.

Buar Island (Boear Island) (5˚26'S., 134˚27'E.), separated from the NW end of Pulau Kola by a narrow channel, is similar to that island in that it is low and densely wooded. A drying reef extends nearly 0.75 mile from the NW side of the island. A 3m reef about 0.5 mile in diameter is 2 miles SW of the SW extremity of Buar Island.

4.29 Pulau Wasir (5˚31'S., 134˚15'E.), the northwesternmost of the Kepulauan Aru group, is about 11 miles WSW of Pulau Buar. It is rocky and somewhat higher in the N part than in the S part. Along the W side of the island, which can be approached rather closely, there are four large wooded rocks. The N most of these rocks can be recognized at a considerable distance offshore. Java Reef, a 15.8m shoal, is 3.75 miles N of the N end of Pulau Wasir. Selat Wasir, the strait separating Pulau Wasir and Pulau Ujir, has general depths of 18.3m, but near midchannel at the NE end there are two shoals that make navigation rather difficult. Over the E shoal, 1 mile NW of the N end of Pulau Ujir, there is a depth of 4.9m; the other shoal, 0.75 mile W of the E shoal, has a least depth of 5.5m. This strait is navigable by vessels drawing less than 4m.

Pulau Ujir (Pulau Oedjir) (5˚36'S., 134˚17'E.), just outside a bight of Pulau Wokam and 3 miles SE of Pulau Wasir, is 7 miles long NE-SW, and 1.25 to 3 miles wide. The N part is higher than the S. A sandbank, dry at all stages of the tide, is on the drying shore reef SW of Tanjung Tutupano (Toetoepano), the W extremity of Pulau Ujir. Reefs extend 0.8 mile from the SE coast and a depth of 0.9m is about 1.4 miles N of the NE end of Udjir. the W extremity of Pulau Ujir.

The W side of Pulau Wokam, the largest island of the Kepulauan Aru group, between the entrances to the rivers Sungi Sisir Watu and Sungi Waliramai, is bordered by a reef about 0.75 mile wide which dries in places. Sungi Waliramai is shallow and has Lewakai Islet off its mouth. The shore in the vicinity of Tanjung Samang, S of Pulau Ujir, is rocky in places and is light gray in color. Between this point and Tanjung Malakafani, the W extremity of Pulau Wokam, the coast is fringed by a reef 0.75 mile wide. Several villages on the N part of this stretch of coast are nearly concealed by trees. The channel between Pulau Ujir and Pulau Wokam contains several dangerous reefs and its use is not advised. Vessels that do use the passage usually await low tide.

Pulau Wamar (5˚48'S., 134˚12'E.), close S of the W most projection of Pulau Wokam, is low and thickly wooded and is fringed by a drying bank except at its NW extremity where there is a drying reef. The town Dobo is on the NE extremity of the island. On the coast just S of Tanjung Ular (Oelar), the NW extremity of the island, there are three conspicuous rocks, and on the reef near Tanjung Batudua (Batoe Doea), the SW extremity of the island, there are two similar rocks.

4.30 Dobo Harbor (5˚45'S., 134˚11'E.), the limits of of which is between the coast of Pulau Wokam and the NE side of Pulau Waram, are lines drawn 045˚ from Tanjung Ular and 225˚ from Tanjung Merukujuring. The harbor is low and rocky. The Pulau Wokam shore of the harbor is mostly covered with mangroves. The width of the channel between the 10m curves is about 0.5 mile at the W entrance and about 0.3 mile abreast the town of Dobo. The area between these curves and the shore is occupied principally by broad drying shore banks. The sandy point on whch Dobo stands can be approached closely. The water in the harbor is so muddy that discoloration is no guide to dangers except those that dry at LW. Shoals, some of which dry, are in the channel about 1.25 miles E of Dobo.

The least depth in the channel to Dobo is 9.3m and is located N of Tanjung Ular. There are depths of 20 to 46m in the anchorage.

The most prominent feature in the vicinity of the harbor is the light structure on Tanjung Ular, from which a light is shown. Another light is occasionally shown on the head of the pier at Dobo.

A submerged pile marked by a buoy is on the S side of the fairway about 1.5 miles E of Tanjung Ular.

A beacon is on the shore bank on the S side of the fairway about 0.6 mile WNW of the light post at Dobo. A partially submerged wreck lies 0.5 mile W of the light at Dobo.

Tides—Currents.—At Dobo the highest water level occurs in February and March, the lowest in July, August, and September. The maximum rise and fall that can be expected are, respectively, about 2.5m above and 0.2m below mean sea level.

Off the entrance to Dobo Harbor the flood current sets to the S, the ebb to the N. During the SE monsoon the flood current is weak, but the ebb current has a velocity of 1.5 knots and lasts longer than the flood; the ebb current is sometimes strong at the anchorage off Dobo.

Directions.—Approaching from W, four openings in the coast will be seen for a considerable distance; the third from the N is the entrance to Dobo harbor. Closer in the light structure on Tanjung Ular will be seen. A vessel should enter with the flagstaff at Dobo, or if this cannot be distinguished, the N most building, a large black shed with a zinc roof, in line with the white beacon bearing 116˚. This will lead over the S extremity of the bank extending S of Tanjung Malakafani. The beacon is sometimes difficult to identify. When the light structure at Tanjung Ular bears 220˚, steer 101˚ until **Tanjung Fanadjuring** (5˚48'S., 134˚19'E.) is seen midway between Dobo and Tanjung Merukujuring bearing 115˚. This leads to the anchorage in depths of 20 to 46m near the pier. The drying banks on each side of the channel may not be marked by discoloration.

4.31 Dobo (5˚45'S., 134˚13'E.) (World Port Index No. 52840) on a small sandy point on the NE side of Pulau Wamar, is the principal port in the Kepulauan Aru group. A 33.5m long pier, with a depth of 3.5m at its head, is used by local trading craft; it was reported in poor condition. An oil jetty is situated 4 miles S of Dobo on the SE side of Wamar.

There is a small hospital, and a doctor. Some provisions are available.

Between Tanjung Malakafani, the W extremity of Pulau Wokam, and **Tanjung Fatujuring** (6˚00'S., 134˚08'E.), the NW extremity of Pulau Maikoor, the irregular coast forms a roughly rectangular unnamed bay about 17 miles long and 8 to 10 miles wide, in the NW corner of Pulau Wamar which has already been described. The entrance to the unimportant river, Sungi Tunguwatu, is at the NE corner of the bay and the

entrances to the rivers, Sungi Manumbai and Sungi Workai, are near the SE corner. The E shore of the bay N of Sungi Manumbai is irregular in outline, with numerous points and bights; between Sungi Manumbai and Sungi Workai the coast is rocky, with several small islets close off near the entrances to the river channels. The S part of the bay is somewhat higher and has rocky points in places. Between **Tanjung Meijuring** (6˚01'S., 134˚13'E.), about midway along the S shore, and Tanjung Fatujuring there is a small unimportant unnamed bay partly closed by a reef with a depth of 1.8m.

Pulau Meirang (5˚50'S., 134˚17'E.) and Lomar are two islets in the N part of the bay close off Pulau Wokam. **Pulau Babi** (5˚55'S., 134˚09'E.), on the W side of the bay between Pulau Wamar and Tanjung Fatujuring, is low but covered with high trees; it is easily recognized by three rocks on the shore reef close of the SW extremity of the island. Several dangers with depths of less than 0.9m are within a 3.25 mile radius SW, W, and NE of **Tanjung Toardefete** (5˚55'S., 134˚17'E.). A rock with a least depth of 1.8m is about 2.75 miles WNW of the same point.

There are so many dangers in the N part of the bay that local knowledge is needed for navigation.

Anchorage.—Anchorage can be obtained in 20m in the bay about 1 mile E of Tanjung Fatujuring and E of a jetty on the W side of the bay. Enter the bay with the E end of Pulau Babi bearing 000˚ astern and a rock at the head of the bay bearing 180˚ ahead. When the white house on the jetty bears 258˚ steer for it on that bearing and anchor when Tanjung Fatujuring bears 323˚. There is a reef off the W side of the bay about 1 mile SSE of Tanjung Fatujuring which is marked by a beacon. A 2.7m shoal is 1.5 miles NW of Tanjung Fatujuring. A 1.8m shoal lies 1.75 miles E of Tanjung Fatujuring.

4.32 Sungi Manumbai (6˚01'S., 134˚17'E.) is the most important of the channels through the Kepulauan Aru group. It is 28 miles long and has a least depth of 5.5m. Because the E part of the channel has not been surveyed, local knowledge is necessary for its navigation.

The flood tidal currents set into the channel at both the E and W ends and the ebb current sets outward. The average velocity of the currents through the mouths is 1.5 to 2.5 knots.

In the approach to the W entrance to Sungi Manumbai there is a bank with a least depth of 4.5m, but there is a channel N and E with a least depth of 5.8m leading to the entrance. A drying reef, extending from Tanjung Belingaratu, the N entrance point of Sungi Manumbai, should be given a wide berth. The village of Kampung Manumbai, on the S side of the entrance and off which there is a rock covered with light-green vegetation, is a good mark and can be passed close aboard. A conspicuous white rocky patch is close E of the village. The shore is rock bound in this vicinity. About 3 miles E of the village there is a bight on the S side. Two islets in the bight are thickly covered with vegetation.

Directions.—After entering Sungi Manumbai steer a midchannel course as far as the above-mentioned bight, then the best water, from 9.1 to 10m is close to the N shore until past the mouth of Sungi Marirremaar, about 4 miles E of the village of Kampung Manumbai. Elsewhere, except at the entrance, the depths are over 10m and the channel is free of dangers. A waterfall is on the N shore about 3 miles farther E, past the entrance of Sungi Marirremaar. Near the entrance of Sungi Api Api, on the S shore, about 4 miles E of Sungi Marirremaar, there is a noticeable hillock. There is another hillock, with a conspicuous tree and vegetation, on a point on the S shore, close W of the position where the river trends E for a short distance. Rocks are close to both shores in places.

About 1.5 miles W of the mouth of Sungi Dosi, in which there are some islets and which is about 9 miles ENE of Sungi Api Api, there is a drying rock which must be passed on the N side. Beyond the mouth of Sungi Feraun, on the N shore about 2 miles ENE of Sungi Dosi, the N shore should be hugged, but thereafter the S shore should be closed by crossing between drying mudbanks in a least depth of 5.5m.

4.33 Sungi Workai (6˚03'S., 134˚15'E.), separating Pulau Koboor and Pulau Maikoor, can be used by vessels of moderate draft as far as Pulau Nyamuk (Njamoek), about 4 miles above the W entrance. The depths are about 4.9m to the E entrance, but at this E entrance there is a least depth of 1.8m, which limits through passage to small boats. Local knowledge is essential.

Pulau Maikoor (6˚13'S., 134˚15'E.), long and narrow, is between Sungi Workai on the NE and Sungi Maikoor on the SW. The island is flat and thickly wooded. The W coast of the island between T**anjung Fatujuring** (6˚00'S., 134˚08'E.) and the entrance to Sungi Maikoor, 8 miles to the S, is fronted by a sandy beach. Sungi Beloide, an unimportant stream discharging into the sea 4 miles S of Tanjung Fatujuring, dries at LW. A bank extending out from the mouth of the stream has depths of 0.9m.

A bank which dries in places extends about 1.5 miles W of the W shore of Pulau Maikoor and detached shoals with depths of 6.9 to 9.1m are within a mile farther seaward.

Sungi Maikoor (6˚09'S., 134˚06'E.) has a broad, deep entrance and can safely be navigated on soundings at least as far as the village of Taberfane, 2.5 miles above **Tanjung Ngoni** (6˚10'S., 134˚05'E.), the S entrance point to the channel. Vessels occasionally call at the village. A large and very steep rock which uncovers at LW springs is in midchannel abreast of the village. The channel above the village appears to be deep, but is too narrow for vessels.

Pulau Trangan is the S most of the large islands of the Kepulauan Aru group. The W side of the island is low and a relatively wide band of soundings with irregular depths is off it. The N part of the coast is wooded. Between Tanjung Ngoni and the entrance to Sungi Serwatu, about 17 miles S, are the mouths of three small rivers, Sungi Hokmar, Sungi Lutur, and Sungi Rebi. A light is exhibited about 2 miles W of Sungi Rebi. On the shore reef just N of Sungi Rebi are two small islets which are seen clear of the land when approaching from the S, but are hard to distinguish from the N approach.

Batavia Reefs (6˚19'S., 134˚00'E.), 10.5 miles SSW of the entrance to Sungi Maikoor and about 4.5 miles offshore, are several shoals with depths of 4.5 to 6.7m. There are two patches here with least depths of 5.5m and 6.8m. These shoals cannot be distinguished by discoloration.

There are several 9.1 to 10m shoals W and SW of the entrance to Sungi Serwatu; the outermost is 6.5 miles offshore. Soundings give warning of approach to these shoals.

4.34 Sungi Serwatu (6˚26'S., 134˚06'E.), which divides Pulau Trangan into two parts has been surveyed only as far as the mouth of Sungi Loloor, a small tributary about 7.5 miles above the mouth. The entrance is about 1 mile wide, but it is fronted by a large bank with depths of 0.3 to 2.4m. A 0.2 mile wide channel, marked by light-buoys, having a least depth of 4.9m leads over this bank. The monsoons are reported to cause this channel to shift. Inside the bar the channel is wider and deeper, but entering vessels should favor the W shore to avoid a drying reef projecting from the shore opposite Tanjung Derehi. The shores are alternately limestone rocks and low mangrove-covered land. The river affords sheltered anchorage for small craft.

The W coast of Pulau Trangan S of the entrance to Sungi Serwatu as far as the village of Kampung Ngaibor, 16 miles to the S, is low with a sandy beach about 91m wide and a wide bank of irregular soundings off of it. The coast is backed by gently sloping land covered with tall grass and shrubs.

Kampung Ngaibor (6˚43'S., 134˚04'E.), located on a small plateau, is the largest village on the W side of Pulau Trangan and is a good landmark. Sungi Ngaibor, the largest freshwater river in the Kepulauan Aru group discharges into the sea about 0.75 mile N of the village.

The coast S of Kampung Ngaibor is low and rocky as far as **Tanjung Lelar** (6˚46'S., 134˚02'E.), the SW point of Kepulauan Aru. From this last point to Tanjung Ngabordamlu, the S extremity of Pulau Trangan, the coast is rocky and somewhat higher than to the N. Because it rises steeply from the sea, the points along it are rather easily recognized. Among the landmarks along this stretch of coast are the mouth of the river Sungi Tafermaar and Bain Hill, which, although 89m high, rises only slightly above the other land in the vicinity.

Tanjung Bain (6˚51'S., 134˚05'E.) is a good radar target at a distance of 25 miles.

Caution.—There are numerous shoals with depths of 2.1 to 10.9m on the bank of soundings between the entrance to Sungi Serwatu and Tanjung Ngabordamlu. Caution must be exercised by vessels proceeding inside the 20m curve. Careful soundings should be taken because they give a fair indication of the approach to the shoal areas. A 5.8m shoal is about 2.5 miles WSW of Tanjung Bain, midway between that point and a large 3.6m shoal off the SE end of Blackburn Bank. This shoal is directly in the path of vessels coming from N and proceeding inshore of Blackburn Bank.

The strong tidal currents, especially those during the ebb, further add to the difficulty of inshore navigation along the W and SW coasts of Pulau Trangan because of the unpredictable manner in which they change direction among the shoals and reefs.

A 9.1m shoal, 183m wide, is about 38 miles W of Pulau Trangan.

4.35 Tanjung Ngabordamlu (6˚57'S., 134˚11'E.) is a relatively low rocky point at the S end of Pulau Trangan. On the drying reef that extends SE from it is a small islet about the same height as the point. Batu Goyang, a large bare, grayrock, 10m high, is on the shore bank 0.5 mile S of the point. Close E of this rock is a rock awash. A 2.1m shoal is 1.1 miles SE of Batu Goyang, and there are several other shoals around Tanjung Ngabordamlu. A 1.4m shoal is reported approximately 1.25 miles S of Tanjung Ngabordamlu. There are usually strong currents, rips, and high seas over the irregular depths on the bank of soundings in the vicinity of the point.

Tanjung Ngabordamlu is a good radar target at a distance of 23 miles.

Blackburn Bank (6˚52'S., 133˚56'E.), about 8 miles off the SW end of Pulau Trangan, consists of several detached shoals with depths of 2.1 to 6.7m with relatively deep water in between. The shoalest part of these detached patches occasionally break. The bank extends, within the 10m curve, for about 5 miles in a NW-SE direction. An extensive 3.6m shoal is about 3 miles E of the SE end of Blackburn Bank. There are other charted shoals between these last two banks and Tanjung Ngabordamlu, and several 9.1m shoal patches are 4 to 8 miles S of the shoalest part of Blackburn Bank.

Because the SW coast of Pulau Trangan has few landmarks and is frequently obscured, no marks can be given for clearing the numerous off-lying dangers. The tidal currents are very strong in the vicinity of the bank and the shoals in the area. It is also quite probable that the currents cause the shoals to shift considerably. Accordingly, vessels should give the bank and the adjacent shoal areas a wide berth.

4.36 East side of Kepulauan Aru.—Except for **Pulau Karaira-besar** (Groot Karaweira Island) (5˚58'S., 134˚50'E.), which can be recognized with local knowledge at a distance of 20 miles, there are no good landmarks on the E side of Kepulauan Aru. The remaining coast appears as one uniform stretch of land, and the off-lying islands are difficult to identify from a distance.

Caution.—Because of strong currents along this coast, it is advisable to keep outside the 20m curve.

The E side of Pulau Kola is rocky but thickly wooded. **Kampung Marlassi** (5˚29'S., 134˚39'E.) and Kampung Masidan, built on a rock 3 miles farther S, are on this coast; from seaward these villages appear as light red spots. A wide reef off Pulau Kulur, as well as the islets to the S, prevents vessels approaching closer than 6 miles unless through one of the narrow channels that cut through the reef. On the reef in many places there are small clumps of trees and some islets such as Pulau Binaar, located N of the E entrance to Sungi Sisirwatu. Two prominent trees are reported about 1.5 miles S of **Tanjung Leitin** (5˚31'S., 134˚41'E.).

Pulau Konan (5˚34'S., 134˚46'E.), 5.5 miles SE of Tanjung Leitin, is an uninhabited, sandy, heavily-wooded, atoll-shaped islet, the highest point of which is a small tree on the NW side. The islet is on the SE part of a large 4.5 mile long reef. On the reef close off the S and N end of the islets are two rocks. On a clear day the islet can be seen for a distance of 13 miles and appears as two small trees showing above the horizon.

Pulau Arar Kula (5˚36'S., 134˚46'E.), on an extensive reef 2 miles S of Pulau Konan, is a coral and mud bank dry at all stages of the tide, although it has been reported that the above-water part of the bank could not be seen either visually or on

radar. There are a few isolated trees on this bank. The reef on which Pulau Arar Kula stands is separated from the one extending S from Pulau Kola by a narrow winding channel, and from Pulau Wokam by a rather wide channel with depths of 5.8m. The S entrance to the latter channel is foul. The channels N and S of Pulau Arar Kula are used by small craft proceeding to Sungi Serwatu, which has already been previously described in paragraph 4.34.

The E coast of Pulau Wokam, like that of Pulau Kola, is thickly wooded and rocky. Of the several villages along this coast the most important is Moha, W of Pulau Arar Kula. These villages are similar to the others on the coast in that they are built on rocks and appear from seaward as red patches.

A projecting point, S of **Tanjung Komfane** (5˚39'S., 134˚45'E.), can be seen for a considerable distance N or S; because of the gaps in the trees on the point, it appears as several separate islands. A group of trees on the point, the tallest of which has a conspicuous hammer-shaped top, can be seen from E or SE for a distance of 15 miles. South of this point is a wooded islet and two islands named Wodinhun and Wahalaulau, which are thickly wooded. Beyond these islands the coast turns W and S and has no recognizable points.

The remainder of the E coast of Pulau Wokam is divided by numerous rivers into several islands, the principal being Aranlau and Sewer. Most of this section of the coast is obscured from seaward by the off-lying islands of Kepulauan Watuli and Kepulauan Jurisan.

Caution.—A 3m shoal is 3.75 miles E of Pulau Arar Kula and a 4.9m shoal is 5.5 miles E of Wodinhun Island.

4.37 Kepulauan Watulai (5˚49'S., 134˚46'E.), is a large number of rocky islands on a very extensive reef through which a few narrow but more or less deep channels give access to the islands' villages and coastal villages. Pulau Jursian and the islets near it may be considered belonging to Kepulauan Watulai. Pulau Aduar, Pulau Kumul, Pulau Watulai, and Pulau Jursian are inhabited.

Rewan (5˚43'S., 134˚48'E.), the N most of the group, is actually three small wooded islets close together; the SW most is the highest, the others nothing more than wooded rocks. These islets are difficult to make out until they are open of Pulau Aduar and Manien. South of Rewan there is another large rock.

Manien (5˚43'S., 134˚47'E.) is thickly wooded and may be seen from the N for a distance of 17 miles. The W side, rocky and higher than the rest of the islet, looks like a point when seen from N. On the E side there is a sandy beach.

Pulau Aduar (5˚45'S., 134˚47'E.), the highest and largest of the Kepulauan Watulai islands, is covered with tall trees. A small wooded hill is on the S side of the island. A narrow 2.8m channel leads to the villages on the island. Ilmamui Island, close S of Pulau Aduar, is lower than that island, but is thickly wooded. Ngoab Islet about 0.75 mile SE of Ilmamui Island, is rocky and covered with low trees; two isolated coconut palms are conspicuous. There is a flagstaff at the villages of Kabalasiang and Bendjoering.

4.38 Kumul Island (5˚47'S., 134˚46'E.), 1.5 miles S of Pulau Aduar, is thickly wooded and is slightly elevated at the center. The SE extremity of the island is a narrow, rocky tongue of land with a remarkable bare spot with a small clump of coconut trees. The village of Kampung Kumul, on the SE side of the island, is reached by a passage through the reef. A flagstaff is at the village. Mangan Island and some small islets are close S of Kumul Island.

Watulai Island (5˚49'S., 134˚47'E.), about 1 mile long, has a bare patch on its N point similar to that on Kumul Island. The village, with a flagstaff, is on the E side of the island. A conspicuous clump of trees about 45m high is NW of the village and forms a mark for navigating the channel through the reef to the villages of Kampung Kumul and Kampung Watulai. The N point of the island can be approached by small vessels at LW.

Pulau Tabar (5˚49'S., 134˚46'E.), thickly wooded and flat, is separated from W side of Watulai Island by a narrow channel. Elel Menalau, and Mentai, on an extensive reef SE of Watulai Island, are rocky islets covered with vegetation. A group of coconut trees is near a village on the NE side of Menlau. The village is hard to distinguish from seaward. The trees on Mentai give the island the appearance of a plume. Ramje, Waria, and other rocky and wooded islets partly close the entrance to a bay W of Pulau Tabar. A village on the NE point of Waria is visible from seaward and is reached by a winding channel leading through the reefs S of Mentai.

Pulau Jursian (Djoersian) (5˚54'S., 134˚46'E.), several rocky wooded islands with several small inlets, are close of the coast of Pulau Wokam. Only the N part of Pulau Jursian can be seen from seaward and it is recognized by Kampung Jursian, built on a rock nearby. Other small islands are off the N part of the island.

4.39 Channel to Kumul Island and Pulau Watulai.— About 2.5 miles NE of Watulai Island is the entrance to a narrow but fairly deep channel leading SW and W toward Kampung Kumul and Kampung Watulai. The outer edge of the reef can be approached by soundings. The best anchorage off the mouth of the channel is in about 5.9m with the N point of Kumul Island in range with Ngoab, bearing about 267˚, and the W of the two small **Maar Islets** (5˚57'S., 134˚47'E.) in range with the E extremity of Menalau, bearing 194˚. Beyond the anchorage mentioned above, local knowledge is necessary for navigating the channel. The channel is only about 137m wide in places and has a least depth of 4m. The ebb current runs outward with great strength at springs.

4.40 Kepulauan Karawaira (5˚59'S., 134˚51'E.) consists of 13 islands and may be divided into two parts, Karawaira-Watulai and Karawaira-Mariri. To the former belong Pulau Karawaira-besar (Groot Karawaira) and Sabir, lying on a drying reef. The Karawaira-Marira group is 2 miles S. The southernmost of this latter group is called Pulau Dorlau, but the others are unnamed. All of these islands are uninhabited and unhealthy.

Pulau Karawaira-besar (Groot Karawaira) (5˚58'S., 134˚50'E.), the highest land on the E side of the Kepulauan Aru group, is visible for a distance of 20 miles. It is rocky, thickly wooded and has several large rocks close to the shore. The highest tree in the middle of the island has a top like a cross and is very conspicuous when seen from E to NE. Sabir Islet,

near the edge of the reef 0.75 mile E of Pulau Karawaira-besar, is small and lower than that island, and because it is nearly divided by a depression, it appears from some directions as two islets. Near the SE point of the islet, a rock above water has the appearance from NE of a lion lying down. The reef on which both islands are situated, and which extends to Pulau Maar on the W, projects 3.5 miles N from Pulau Karawaira-besar, and has on it some sandbanks that dry at half tide.

The islands of the Karawaira-Mariri group extend N and S about 4.5 miles. Pulau Dorlau, the southernmost island, is covered with vegetation and has two high trees on it. East of the reef of Karawaira-Mariri, a black coral reef that dries at LW has its center 1.5 miles from the E edge of the reef. Some low, isolated trees are on the S part of the reef surrounding Karawaira Mariri.

Pulau Maar (5˚57'S., 134˚47'E.) is actually two small rocky islets, of which the W is the higher. The E islet when seen from NE appears as two, but the two parts are connected by a natural stone bridge.

East of the reef of Pulau Karawaira-besar and separated from it by a channel with depths of 5.5 to 6.8m is a reef 8 miles long in a N-S direction, and 2.5 miles wide at its S end abreast of Pulau Karawaira-besar, then tapering to a point at its N end with depths of 2.7 to 4.9m. Off the S part is a small detached 2.1m shoal. The outer edge of the reef is 4.75 miles NE and 4 miles E of Pulau Karawaira-besar and its N end is 4 miles E of Watulai Island. It may be approached by soundings.

Batu Kapal (6˚04'S., 134˚50'E.), about 2.5 miles SSW of Pulau Dorlau and 4 miles off the coast of Pulau Kobroor, is a high, partly-wooded rock, which when open of the Pulau Kobroor coast, is a good mark. It is considered sacred by the natives. The channel N and E of this rock is foul, and a 4.5m shoal is 0.8 mile E. A reef with a small sandbank which is dry at HW is 3 miles ESE of Pulau Dorlau.

4.41 Channels to Sungi Monumbai.—Small local craft bound for Sungi Monumbai usually take the channel that leads N and W of the reef on which Pulau Karawaira-besar is located, past Pulau Maar, then in a SW direction to the channel entrance. Another approach leads either N or S of the drying reef SSE of Pulau Dorlau, S of Batu Kapal, then to the channel. There is good anchorage S of Batu Kapal. Sungi Namumbai has been described earlier with the W coast of Kepulauan Aru.

Kepulauan Mariri (6˚11'S., 134˚51'E.) consists of Pulau Mariri, Pulau Leer, and several smaller islands, of which Lola is the southernmost and most important. The group is about 5 miles off the coast of Pulau Kobroor along a NNE-SSW line and are in great part overgrown with coconut trees. The area between these islands and Pulau Kobroor is almost entirely occupied by sandbanks and reefs. There are often heavy tide rips on the shoals between Kepulauan Karawairi and Kepulauan Mariri. On the N side of Pulau Mariri, the N island, there are two conspicuous coconut trees that can be seen for about 15 miles. Two rocks are off the N end and two are off the W coast of Pulau Mariri and two more are off the SE point of the island. The village of Kampung Mariri, easily seen from seaward, is on one of the latter rocks. A reef with two high sandbanks extends 1 mile W and NW from Pulau Mariri. On the E side of the island the reef is comparatively close to the shore and depths decrease gradually from seaward. This reef is separated from the rest of Pulau Mariri by a channel with a depth of 3.9m. Anchorage can be taken in 6.7m with Kampung Mariri bearing 268˚, about 0.75 mile offshore. There is a 4.6m shoal 0.75 mile SE of Kampung Mariri. Wadidjili Islet and Sedja Islet, which is in two parts, are on the reef NE of Pulau Leer.

Pulau Leer (6˚12'S., 134˚51'E.), 1.5 miles S of Pulau Mariri is heavily wooded and may be recognized by its many dead trees. When coming from SE, Pulau Leer and the highest point of Pulau Mariri are sighted first. Five small, rocky islets are on the reef off the S point of Pulau Leer. Kampung Lola is on Lola Islet, the S most and largest islet, and a clump of coconut trees is on a point of land just S of the village. Lola Islet, is surrounded on the E and S by a reef with a least depth of 4.5m. Small vessels can approach the village to within about 183m.

Epar (6˚11'S., 134˚49'E.), on a separate reef W of Pulau Leer, is rocky and overgrown and is actually two islets that appear as one from seaward.

4.42 East coast of Pulau Kobroor.—From Tanjung Balatanjuring (6˚05'S., 134˚45'E.), the NE point of Pulau Kobroor, the coast trends NW forming the S bank of Sungi Manumbai. From the same point it stretches S and SW for about 20 miles to the SE point of the island. Laklakar Island, 1.5 miles SE of Tanjung Balatanjuring is rocky, wooded and surrounded by seven detached rocks covered with vegetation. About 3 miles S of Laklaklar is the mouth of the river Sungi Warloi. Leliling Island, with the village of Warloi on its E side, is in the river entrance channel. North of the village is a tree with a conspicuous white bare trunk. There are several villages on the coast of Pulau Kobroor; Kampung Kobroor is at the mouth of the river of the same name and Kampung Pono is on the rocky SE extremity of the island at the entrance to the river Sungi Workai. The coast reef extends out in some places up to 2 miles, but it has not been fully examined. On this reef are Waria, Kokwana, and Kuling Islets, and two rocks.

Pulau Penambulai, Pulau Barakan, and Pulau Workai are three relatively large islands lying, respectively, off the SE part of Pulau Kobroor, the E side of Pulau Maikoor, and the NE part of Pulau Trangan. Except for a few places where the coast is rocky, these three islands are low but covered with high trees. However, the NE side of Pulau Penambulai has been reported as being radar conspicuous. Since the area W of the outer string of islands has not yet been surveyed, little, is known about Pulau Mimien, Kool Mimien, Pulau Lelamtuti, Pulau Wolvat and Pulau Baun, between the three off-lying islands and the shores of the main islands mentioned above.

Among the landmarks on the E side of Pulau Penambuli are: **Tanjung Uafa Fenjuring** (6˚19'S., 134˚53'E.), a conspicuous point with high trees and a sandy beach, about 2.25 miles SE of the N end of the island; a clump of trees about 49m high just N of Kampung Rabal, about 3 miles S of the above point; and a conspicuous tree with a bare straight trunk and a thick top on Tanjung Ki, 5 miles SSW of Kampung Rabal.

The rocky NE point of Pulau Barakan is a good landmark visible at a distance of 14 miles. About midway on the E side of the island the trees are conspicuously higher than they are elsewhere on the island.

On the extensive reef surrounding Pulau Workai there are a number of smaller islands. One of these, **Pulau Turturjuring** (Toertoer Djoering) (6˚38'S., 134˚45'E.), separated from the N part of Pulau Workai by a very narrow, drying channel, is thickly wooded and somewhat higher than the land in back of it, and because of that looks like a small hill when seen from N. On the reef about 3 miles S of the E extremity of Pulau Turturjuring are Kultubai Utara (Koeltoebai Noord), three low, wooded, atoll-shaped sandy islets of which the easternmost is the largest. These islets are easily distinguished from N, but from the S they merge with the higher Tanjung Turturjuring. Between these islets and Tanjung Turturjuring, about 0.75 mile S of the latter, is a sandbank, part of which remains dry at all stages of the tide.

There is a convenient roadstead S of Kultuba Utura in the inlet in the extensive reef. A beacon is on the edge of a drying reef about 5 miles N of Kultubai Selatan (Koeltoebai Zuid), the eastern-most island of Kepulauan Jin (Djoeedin Eilanden). Depths of about 7.3m will be found in the E part of the roadstead; bottom is sand and mud.

4.43 Northeast approach to Sungi Workai.—The SE entrance to Sungi Workai at the S end of Pulau Kobroor is approached by a channel from NE with very irregular depths leading between Lola and the N end of Pulau Penambulai.

Approach this channel steering for the sandy E entrance point of **Sungi Kangurma** (6˚17'S., 134˚51'E.), at the N end of Pulau Penamumbai, bearing 210˚, until the SW end of Pulau Mariri is in line with Sedja Islet, the S of the two islets close off the NE of Pulau Leer bearing about 344˚. **Djarang** (6˚12'S., 134˚46'E.), an islet about 1.5 miles off the coast of Pulau Kobroor and about 3 miles S of Leliling, will then be open SW of Lola, bearing about 296˚. The velocity of current here is sometimes 3 knots setting offshore with a falling tide and S with a rising tide. Then steer 242˚ until Epar, the double islet 1.75 miles W of the N end of Pulau Leer, is open SW of Lola, bearing about 330˚, then steer 269˚ which will lead to an anchorage about 2 miles S of Kampung Lola where there are depths of 10 to 10.9m, sand, mud, and coral.

Sungi Workai (6˚03'S., 134˚15'E.) is one of the channels connecting the E and W coasts of Kepulauan Aru. It is used, however, only by small craft with local knowledge. The W approach to the river has been previously discussed. The E entrance is about 11 miles W of the SW side of Pulau Penambulai.

4.44 Southeast side of Kepulauan Aru.—Kepulauan Jin (Djoeedin Eilanden), on the S side of an extensive reef almost touching the S end of Pulau Wokai, are six low, sparsely-populated islands.

Kultubai Selatan (Koeltoebai Zuid) (6˚52'S., 134˚43'E.), the easternmost of Kepulauan Jin, is wooded, but a gap in the woods makes the island appear as two when seen from S. Two conspicuous trees stand close together near the W end of the island and are visible except between 203˚ and 338˚. There are shrubs on the reef N of this island.

Maardjinjin (6˚52'S., 134˚41'E.), close W of Kultubai Selatan and with narrow Wadidin Islet between, has a tree with a V-shaped top on its S side.

Pulau Juedin (Pulau Djoeedin) (6˚52'S., 134˚37'E.), the westernmost and largest of the islands of the Kepulauan Jin group, is tree covered with the highest on the E side of the island. A tall tree, with a top that resembles a church with a steeple when seen from S, is on the SE side of the island. A reef, with a dry sandy cay near its outer edge, projects 0.75 mile S from the SW end of the island. Anchorage can be taken during the SE monsoon in 15m off the W end of the island. Local knowledge is necessary. The flood tidal currents set N at a rate of 1.75 knots and the ebb currents set S at a rate of 2 knots in the vicinity of the anchorage.

Caution.—A 4.9m reef is located about 3.5 miles SSW of the conspicuous tree on the S side of Maarjinjin and a 3.5m shoal is 6.5 miles S of the W end of Kultubai Selatan and 3.75 miles NE of Pulau Karang's N end.

A wreck has been reported in a position about 5 miles E of the N most point of Pulau Jeudin or about 1.75 miles N of Pulau Kultubai which is located close E of Maardjinjin.

Pulau Mar (6˚54'S., 134˚31'E.) and Pulau Jeh (Pulau Djeh), about 2.75 and 5 miles, respectively, SW of the W end of Pulau Jeudin, are low and uninhabited. The islands are heavily wooded except for the SE part of Pulau Jeh which has a few isolated trees. A narrow but clear 6.7m channel separates the islands. Tidal currents are strong in this channel. Pulau Mar is near the SE end of a very extensive reef.

Pulau Penjuring (6˚44'S., 134˚29'E.), on the broad reef N of Pulau Mar and between Pulau Workaiand Pulau Trangan, consists of several small heavily-wooded islets that appear as one island. Between the Pulau Penjuring reef and Pulau Trangan there is a deep channel which provides access to the villages of Krei-baru (Niew Krei) and Krei-lama (Oud Krei) on the shore of Pulau Trangan.

Pulau Enu (7˚05'S., 134˚29'E.), 18.5 miles ESE of Tanjung Ngabordamlu, the S end of Pulau Trangan, is the S most island of the Kepulauan Aru group. It is low and uninhabited, and is surrounded by a narrow coral reef. A 4.9m shoal is 2.5 miles SSW of the W end of the island. The island is a good radar target at a distance of 14 miles.

Pulau Karang (7˚01'S., 134˚39'E.), about 8.5 miles ENE of Pulau Enu and the same distance SSW of the W end of Kultubai Selatan, is a low wooded island surrounded by a coral reef. The tidal flood currents set NE at a rate of 1.75 knots and the ebb in the direction between SW and WSW at the same rate off the NW side of the island. Vessels navigating in the vicinity of the island must exercise care to avoid the 3m shoal 3.75 miles NE of the N end of the island.

4.45 Southeast coast of Pulau Trangan.—The N part of this coast is low, but the S part, consisting of low hills covered with vegetation, is relatively steep. Northeast of Tanjung Ngabordamlu are some low red cliffs. Between the last-named point and a point 4 miles SW of **Tanjung Goldjuring** (6˚49'S., 134˚22'E.) there are two large trees near the shore and vessels can approach the shore to within a relatively short distance of them. Anchorage can be taken during the NW monsoon off this stretch of coast. Farther NE the coast is fronted by extensive drying banks with several reefs and small islets. Two of the reefs are marked by beacons. Sungi Laelaemaar, entered close NW of Tanjung Goldjuring, is navigable only by small craft.

Off-lying dangers.—A 2.7m shoal is 3 miles ESE of Tanjung Ngabordamlu. Shoals, 4.5m and 4.9m are, respectively, 7.5 and 9 miles S of Tanjung Goljuring. Two drying reefs are, respectively, 1.5 miles SSE and 2.5 miles SE of Tanjung Goldjuring. A small hut on pilings on each of these reefs are good landmarks.

4.46 Krei-lama (Oud Krei) (6˚45'S., 134˚23'E.), the principal village in the S part of the Kepulauan Aru group is on the Pulau Trangan shore about 4 miles N of Tanjung Goldjuring. Krei-baru (Nieuw Krei), another village, is 2.5 miles farther N.

Two channels lead to Krei-lama. The W channel with a least depth of 5.5m, runs close along the shore of Pulau Trangan. It is narrow but navigable at all stages of the tide. Vessels may pass through this channel by eye provided soundings are constantly taken. North of Tanjung Goldjuring the W side of the channel should be favored to avoid a small drying reef off the village of Kampung Biltubur.

The E channel is wider than the other but it is more difficult to navigate. It is practicable only after high tide when the reefs are visible.

Directions.—The W side of the small islet S of Kumnaar and 1 mile NE of Krei-lama in range with the E side of Pulau Karwai, bearing 349˚ should be an excellent mark. If the first-name islet is not visible at a sufficient distance, the E side of Pulau Karwai should be steered for on that same bearing. This course is difficult to make good because of frequently strong tidal currents in this vicinity, and, being influenced by the openings in the extensive drying reef around Pulau Penjuring, does not always set along the axis of the channel. Care is necessary to avoid the 1.8m shoal extending from this reef to Wolil Island because this shoal is steep-to on the channel side and soundings give no warning of the approach to it. After passing this shoal and the reef marked by a beacon standing 4 miles W of Wolil, steer between Pulau Karwai and the drying reef SSW of it, then N toward the small islet about 0.5 mile of Krei-lama. There are depths of 2.3 to 11.9m off the village.

Kepulauan Sermata

4.47 The Kepulauan Sermata group comprise a long chain of islands extending from off the E extremity of Timor to within about 55 miles of the Kepulauan Tanimbar group. The islands of Kepulauaun Sermata are mostly of volcanic origin, and, because they rise steeply from the sea, they afford only a few good anchorages. These islands may be considered as belonging to two chains that diverge slightly to the E. The principal island in the N chain is Pulau Wetar (See Pub. 163—Sailing Directions (Enroute) for Borneo, Jawa, Sulawesi and Nusa Tenggara). The S chain consists of Pulau Kisar, Pulau Leti, Pulau Moa, Pulau Lakor, Pulau Sermata, and Pulau Babar.

Kepulauan Romang

4.48 The Kepulauan Romang group, about 45 miles NNE of the E extremity of Timor, consists of several hilly islands. The most prominent peaks are on Pulau Romang, Pulau Nyata, Pulau Tellang, and Pulau Maopora. The channels between Pulau Romang and the adjacent islands as well as the channel between Pulau Kital and Pulau Maopora are deep and clear of dangers.

Tides—Currents.—Generally the flood currents set to the N and the ebb currents to the S. The maximum rate of current in the narrow channels is about 2.5 knots, and in the wider channels about 1.5 knots.

Pulau Romang (7˚35'S., 127˚25'E.), the principal island of the group, is about 11.5 miles long NE-SW, 7.5 miles wide, and is surrounded by a steep-to reef. The 20m curve passes along the edge of this reef. The only shoal spot is a detached 8.8m reef about 0.75 mile off the N side of the island.

The S and SW coasts of Pulau Romang are rocky and closely-backed by a rather high plateau which is separated from the higher NE part by a swampy section. Anchorage can be taken off the S side of the island in a depth of 29 to 35m, sand and stone, opposite a sandy beach near a deserted village W of the S extremity of the island. The preferred anchorage with the S extremity of the island bearing 094˚ and small conspicuous house on the beach, between the S and SW extremity of the island, bearing 004˚.

The W coast of Pulau Romang is rocky except in a bight about 4 miles N of the S end of the island. The deserted village of Hila is at the head of this bight. Anchorage can be taken during the SE monsoon in 35m, stone, 0.13 mile off the coastal reef abreast the N entrance point of the bight with the outermost houses of Hila bearing 150˚.

The 747m summit of the island is near the W side, about 2.75 miles S of the N extremity of the island.

The N coast of Pulau Romang consists of rocky stretches alternating with small sandy beaches. Anchorage can be taken in **Teluk Zwaan** (7˚30'S., 127˚24'E.) and in the coves to the E. The anchorage in Teluk Zwaan, S of the detached reef that uncovers near the middle of the bay, has about 183m of swinging room with good holding ground. The bay should be entered only when the reefs are clearly showing. Local knowledge is necessary.

The E coast of Pulau Romang is generally quite steep, except in Teluk Rumahkuda, which has a long sandy beach. During the NW monsoon anchorage can be taken in 65m about 0.15 mile off the coastal reef in the S entrance to the channel between Pulau Romang and Pulau Tellang with the two points to the N in range and the conspicuous house on the heights of Pulau Romang bearing 281˚. Currents attain a rate of 1.5 knots here.

4.49 Teluk Rumahkuda (Roemahkoeda Bai) (7˚37'S., 127˚25'E.), an indentation in the SE coast 4 miles NE of the S extremity of Pulau Romang, affords excellent anchorage 0.15 mile off the coastal reef in 61 to 70m with the mouth of the small river at the head of the bay bearing 315˚ and the village of Kampung Rumahkuda bearing 022˚. This anchorage can accommodate one vessel and has about 0.15 mile of swinging room. The coastal reef is marked by discolored water.

Caution.—The coastal reef has extended further seaward than is charted off Hoewai, El Madang, and Meti Akwalu.

Pulau Mitan (7˚38'S., 127˚26'E.), 2 miles SSE of Kampung Rumakhuda, is about 93m high and covered with gray coral lime.

Pulau Nyata (Njata) (7˚31'S., 127˚18'E.), 3.5 miles W of the NW part of Pulau Romang, is surrounded by a steep-to reef outside of which there are no dangers. There is no anchorage in the vicinity of the island.

Pulau Tellang (7˚32'S., 127˚33'E.) and Pulau Limtutu are two small islands on the same reef 3 miles E of the NE extremity of Pulau Romang.

Pulau Laut (7˚32'S., 127˚33'E.), a mass of rocks 56m high, is about 0.5 mile NE of the N end of Pulau Tellang. Pulau Kital, a cone-shaped island 65m high, is nearly 1 mile E of the S end of Pulau Tellang. It is separated from Pulau Tellang and Pulau Limtutu by a deep and clear channel in which anchorage can be taken, with local knowledge, in about 21.9m, sand and stones. Currents set through this channel with a maximum velocity of 2.5 knots.

Pulau Maopora (7˚35'S., 127˚36'E.), about 6 miles E of Pulau Romang, is 310m high near its N end. There is a sandy beach along the W side of the island but there is no anchorage off of it. A 35m bank projects 2 miles from the N end of the island. Anchorage can be taken over a 10.9m shoal on this bank about 0.5 mile E of the N end of the island. There are strong tide rips, however, over this bank. The N coast of the island is rocky and steep. The E shore especially near the S end is marsh. Pulau Juha (Djoeha), 1 mile E of the SE point of Pulau Maopora, is a sandbank covered with vegetation, dry at all stages of the tide. It is surrounded by a very steep-to reef. Anchorage can be taken in the channel between Pulau Juha and the coastal reef of Pulau Maopora. This channel has a depth of 50m and is about 183m wide. The channel is easily navigated when the reefs are showing clearly. Two small islets, covered with vegetation are on the reef off the SE end of Pulau Juha. They are easily distinguished. The maximum strength of the tidal currents through this channel is 2 knots.

Pulau Gunungapi (Goenoeng Api) (6˚39'S., 126˚40'E.), an isolated island about 67 miles NW of Pulau Romang, is an uninhabited volcanic island 282m high with the shape of a truncated cone and with almost bare slopes. There is occasional volcanic action. The W edge of the volcanic crater is considerably lower than the remaining edge. A coastal reef extends up to 0.13 mile off the island. With light SE winds a small vessel with local knowledge can anchor on a bank off the N side of the island 0.15 mile offshore.

Kepulauan Damar

4.50 The Kepulauan Damar group of islands, ranging from 75 to 100 miles NE of Pulau Romang, consists of Pulau Damar, Pulau Teun, Pula Nila and several smaller islands. These islands are high, and, rising from the sea, make good landmarks. Pulau Damar, Pulau Teun, and Pulau Nila are inhabited.

Pulau Damar (7˚08'S., 128˚36'E.), the largest island of the group, is roughly rectangular, about 9 miles long and 7.5 miles wide. The island has several peaks, of which the highest named Wuwarlali, is 868m high and is on the NE corner of the island. There is some volcanic activity on the island, but no eruptions have been reported. Earthquakes, accompanied by sea disturbances are, however, frequent. The W side of the island is low in places, but the other coasts are steep-to. The island is very fertile and has several small streams.

Teluk Solat (7˚09'S., 128˚41'E.), on the E side of Pulau Damar, is a deep bay penetrating the island for 2.5 miles; it is surrounded by high and very steep volcanic hills that are wooded to the water's edge. The village of Kampung Wulur is on the SW side of the bay and the villages of Kampung Solat and Kampung Kehli are on the N shore opposite. A pier for small craft projects from a peninsula near Kampung Solat. The head of the bay is filled by a large drying reef extending as far E as Kampung Kehli. This reef shows by discoloration between Kampung Kehli and Kampung Solat, but does not show well elsewhere. There are some hot springs at Kampung Kehli.

Tides—Currents.—In Teluk Solat the maximum fall of tide that can be expected is 1.2m and this occurs in June and December. The maximum rise of 0.7m occurs at all semidiurnal spring tides.

Anchorage.—During the NW monsoon Teluk Solat affords good anchorage in about 50m with a house, at the mouth of a small stream 0.4 mile NW of Kampung Wulur, bearing 294˚, and the pier at Kampung Solat bearing 000˚. During the SE monsoon a heavy swell sets into the bay.

Directions.—Because there are no detached dangers in Teluk Solat it is easily entered. The reefs and both sides of the bay are not more than 183m wide, however, because the prevailing winds push rollers onto the N shore and the currents set in the same direction, care should be taken to avoid approaching the N shore too closely. In entering the bay steer for the house, at the mouth of a small stream 0.45 mile NW of Kampung Wulur, bearing 294˚.

Teluk Wilhelmus (7˚06'S., 128˚39'E.), on the N shore of Pulau Damar affords anchorage sheltered against the SE monsoon, however, the holding ground is poor and the bottom rises rather sharply. Vessels proceeding to this anchorage enter on a southwesterly course, steering toward the mouth of the small stream that empties into the head of the bay. This anchorage is not safe during the NW monsoon. Local knowledge is necessary.

Anchorage can be taken off the S coast near **Tanjung Paran** (7˚13'S., 128˚38'E.). Vessels approach with the tangent of the SE extremity of Terbang Utara (North Terbang) astern, bearing 210˚, and anchor on that line in any desired depth clear of the coast reef.

4.51 Terbang Islands (7˚20'S., 128˚33'E.), composed of Terbang Utura (North Terbang), 142m high, and Terbang Selatan (South Terbang), 122m high, are located, respectively, 5.5 and 9.5 miles S of Pulau Damar; both islands are uninhabited. The highest part of Terban Selatan is a plateau that is steep and the N side and moderately sloping on the S. Temporary anchorage can be taken near the S end of Terbang Utara in a depth of about 73m with the 463m elevation at the SE end of Pulau Damar lying midway between the SE point of Pulau Damar and Terbang Utara. Depths increase rapidly just outside this position. There is sometimes a very strong current in the channel between Terbang Utara and Terbang Selatan.

Nus Leur (Noes Leoer) (7˚14'S., 128˚23'E.) consists of two small islands, 46m and 30m high, respectively, on an extensive coral reef 8.5 miles SW of the W extremity of Pulau Damar. The reef is too steep-to for anchorage here.

Pulau Teun (Teoen) (6˚58'S., 129˚08'E.), 26.5 miles ENE of Pulau Damar, consists principally of an active volcano, 655m high, with a crater that is visible from N but not from S. Eruptions from this volcano have been known to occur.

There are several villages on the island. Vessels may obtain anchorage with local knowledge off the village of **Lajoni** (7˚00'S., 129˚07'E.), off the SW coast, in a depth of 13m with the flagstaff of the village bearing 050˚ and the N entrance point of the small bay in which the village stands bearing 332˚. The bottom is very steep-to. The flagstaff is clearly visible and there is a church which is partially obscured by a large tree.

4.52 Pulau Nila (6˚44'S., 129˚30'E.), 23 miles NE of Pulau Teun is a steep volcanic island, 781m high, with a few scattered patches of trees and shrubs. The only eruption on record occurred in 1932, but steam, sulphur vapor, and hot springs are observed regularly on the E side. The N half of the island is fringed by a steep-to coastal reef which dries. A ridge with a depth of 3m is off the NW edge.

Pulau Kari (Nika Islet) (6˚42'S., 129˚31'E.), an islet 47m high, is on a reef that extends 1.25 miles N from the N side of Pulau Nila. Vessels should not approach the N side of Pulau Nila within the 200m curve unless seeking anchorage in the channel that penetrates the reef W of Pulau Kari. There are some coconut plantations on this side of the island.

Anchorage.—Vessels anchor 0.4 to 0.5 mile W of the N side of Pula Kari in depths of 29 to 40m in a channel between the reefs N of Pulau Nila. This channel has a navigable width of about 183m between rocks bordering the reefs on each side, with a least midchannel depth of 7.6m. The summit of Pulau Nila bearing 190˚ leads into the channel, but caution is necessary because of the currents which sometimes set diagonally across the entrance. The small islet of Nusafnu, close off the middle point of the N coast of Pulau Nila, is a useful mark but it is difficult to make out from the entrance. About 0.5 mile SW of the anchorage is a small drying reef. Because of the volcanic activity in this vicinity it is advisable to send a boat ahead for soundings and to mark the reefs along the channel before attempting to proceed to the anchorage. This anchorage can also be approached from the W by keeping the S side of Pulau Kari bearing 093˚, but caution should be exercised because this course leads only 0.38 mile N of the detached reef referred to above.

4.53 Wotai Road (6˚45'S., 129˚29'E.), on the S side of Pula Nila, is open to the S and is exposed to wind and sea during the SE monsoon. In the NW part of the road is Teluk Solat, a narrow bay that penetrates the coast for a distance of a mile. In the middle part of the bay there is an average depth of 37m, but drying reefs fill the N part and cut off the entrance to the bay. The village of Wotai, with a flagstaff, is on the N shore of the roadstead. In the road, outside the shore reef, the depths are irregular. To insure against uncharted risings of the bottom as a result of volcanic activity it is advisable to send a boat ahead to make soundings and to mark the reefs before proceeding to anchorage. The recommended anchorage is in depths of 46 to 61m with Wotai village bearing 342˚.

Doesborgh Reef (6˚40'S., 129˚25'E.), 4.5 miles NW of Pulau Nila, is a drying, rock, atoll-shaped formation 2.25 miles long NE-SW and 1 mile wide.

Nil Desperandum (Griffen Reef) (6˚37'S., 129˚47'E.), about 17 miles ENE of Pulau Nila, is about 0.75 miles long E-W and 0.5 mile wide. It is composed of sand and coral and dries 1.8m.

Pulau Serua (Seroea) (6˚19'S., 130˚01'E.), about 37 miles NE of Pulau Nila, has a 641m truncated conical volcanic peak near its center. On the NW side is a lesser peak 244m high. The last eruption occurred in 1844. The coasts of the island are clear except for a few narrow coastal reefs which do not exceed 183m wide. Kekeh Besar, 193m high, is on a bank of soundings extending almost 1.5 miles W of the W end of Pulau Serua. Kekeh Ketjil, a much smaller island, is about 183m E of Kekeh Besar. The passage between Pulau Serua and the reef on which these last two islands lie is deep and clear of dangers.

Anchorage can be taken in a depth of 61 to 70m in the channel between Kekeh Ketjil and Pulau Serua. There is also anchorage in depths of 70 to 82m off a small sandy beach on the N side of the island. Some conspicuous boat sheds are on this beach. Vessels approach and anchor with these sheds in range with Lesluru (Lesloeroe) village bearing 186˚ and 0.18 mile N of the drying reef. The village is in a saddle-like depression between the two main peaks of the island.

Kepulauan Sermata—Southern Chain

4.54 The E end of Timor (See Pub. 163, Sailing Directions (Enroute) for Borneo, Jawa, Sulawesi, and Nusa Tenggara) is high and the coast is steep-to. A range of mountains, 435 to 1,219m high, extends in a SW direction from this point, paralleling the coast a distance of about 2 miles.

Jaco Island (Jako) (8˚26'S., 127˚20'E.), off the E extremity of Timor, is a small flat, uninhabited island, 81m high, covered with trees. It appears as a part of Timor except when seen open of that island. Jaco Island is fringed by a reef varying in width from a few yards on the W side to about 0.2 mile on the N and S sides of the island.

Selat Jaco (Jako Strait) is a deep clear channel, 0.3 mile wide between Jaco Island and Timor. The strait can be safely navigated at midchannel.

Tides—Currents.—The tidal currents set directly through the strait at a rate up to 4 knots. The N current is of greater duration than that setting S. Tide rips occur at each entrance. Heavy seas prevail off the S entrance during the SE monsoon.

Pulau Kisar (8˚04'S., 127˚11'E.), about 18 miles NNW of the E end of Timor, has a number of rocky hills, the highest of which is 240m high. The coasts, rising steeply from the sea, are gray terraced walls of bare coral lime broken in only a few places where small streams empty into the sea. The inland hills, seen through the breaks in the cliffs, are also gray and are sparsely wooded.

4.55 Pantai Wonreli Road (8˚05'S., 127˚09'E.) is an open roadstead on the W side of Pulau Kisar. A light is exhibited close N Pantai Wonrali Road. A narrow drying reef, with deep water behind it, is about 91m offshore and acts as a natural

breakwater. A shallow channel, used by flat-bottomed boats at LW and by loading proas above half-tide level gives access to the area behind the reef. The shore of the bight is a sandy beach with a few sheds. A conspicuous white pyramid is on the S shore of the bight.

Anchorage is available in 29 to 40m, coral and stones, about 137m WNW of the white pyramid mentioned above. Farther offshore the bottom is so steep that there is the danger of dragging anchor. It is customary to run a hawser to the shore, but with an offshore wind or at the change of the monsoon and during the SE monsoon, when the tidal currents set along the shore in a NNE and SSW direction, it is very improbable that even a very strong hawser would hold a vessel in position. During an onshore wind this anchorage cannot be used.

Winds—Weather.—During some months of the year cyclonic of "Valwinden" winds make the anchorage untenable. The NW monsoon not only makes anchorage impossible but also prevents boats from approaching the shore. During that season contact with the island is made on the E side at Pura Pura, which will be discussed later, where vessels heave-to and send boats ashore.

Tides—Currents.—At Pantai Wonreli Road the maximum rise of tide, occurring in March and September, is 0.9m above mean sea level. The lowest LW, 0.85m below mean sea level, occurs between January and March and between July and September at semidiurnal spring tides.

Pantai Wonreli (8˚05'S., 127˚09'E.), some distance inland, is the only village any importance on Pulau Kisar. It is the headquarters of a government official and there is a large church in the village. Vessels call regularly at the village except during the NW monsoon when the port of call is at Pura Pura on the E coast.

Rain is very uncertain on Pulau Kisar. Frequently a whole year will pass without rain. On such occasions the entire population moves temporarily to Pulau Romang.

Kepulauan Leti

4.56 Kepulauan Leti (8˚11'S., 127˚55'E.), a group of islands ENE of the E extremity of Timor, includes Pulau Leti, Pulau Moa, and Pulau Lakor. Pulau Leti and Pulau Mao are fairly hilly, but Pulau Lakor is rather low however, since the trees on the latter island reach heights of more than 49m, the island can be seen more than 15 miles.

Destructive cyclonic storms sometimes occur in these islands, particularly in the spring at the change of the monsoon.

Pulau Leti (8˚12'S., 127˚42'E.), the W most island of the Leti group, is about 22 miles ENE of the E end of Timor. Along the middle of the island is a chain of rounded hills the highest of which is 406m high. The hills in the central part of this chain are not wooded but are sparsely covered with tall grass. The low hills at the E end of the chain are covered with trees. On the low parts of the island there are many coconut palms. At the base of the hills and extending to the shore is flat land that forms a sort of terrace 7.6 to 18.3m high. On the S side of the island there is a separate plain which rises steeply from the sea where it is undermined by the action of the breakers. A reef skirts the E side of the island.

A light, from which a racon transmits, is exhibited from from a white framework tower near **Tanjung Tutpateh** (8˚13'S., 127˚36'E.), the W point of Leti.

The inhabitants of Pulau Leti dwell on the flat land, usually near the shore. The villages are mostly built on coral reefs 9.1 to 12.2m high. Water Buffalo, goats, and pigs are plentiful, however, the island is subject to drought and famine, at which times the inhabitants migrate temporarily to Pulau Moa.

Anchorage.—During the SE monsoon vessels can anchor off the village of Kampung Serwaru lying on a bare strip of land fronted by a sandy beach on the N side of Pulau Leti. The coast is low for several hundred yards E of the village, but beyond this it becomes steep with cliffs and trends NE for a short distance forming a small bight protected on its W side by short coral stone mole. Because of a detached offshore drying reef, loading and unloading can only be carried on at HW and even then it is difficult if there is any sea. Anchorage can be taken in 26 to 29m, coral and stones, poor holding ground, with the N extremity of Pulau Leti, near Tutukai village bearing 101˚ and Waurlawan, the highest hill on the island bearing 180˚. This anchorage is dangerous during the NW monsoon.

There is anchorage in 37 to 73m on the S side of the island in front of the village of Luhulele, about 2.75 miles from the E end of the island. Vessels can anchor anywhere between the crescent-shaped drying reef S of the E end of the village and a sandy bank projecting 1 mile in a SW direction from the shore 1.5 miles W of the village. Swinging room is limited and there is a least depth of 7.9m in the entrance which is about 137m wide. Local knowledge is recommended for both of the above anchorages.

4.57 Selat Moa (8˚10'S., 127˚45'E.), a deep clear passage between Pulau Leti and Pulau Moa, is about 2 miles wide. Tidal currents in the strait are strong and sometimes cause a very choppy sea when setting against the wind.

Pulau Moa (8˚12'S., 128˚00'E.), E of Pulau Leti, is a coral lime plateau with two groups of hills. The W group of hills has a maximum elevation of 289m 5.5 miles E of the W end of the island, and the E group has a maximum elevation of 375m 2 to 4 miles E of the island's center. A few of the hills are wooded, but most of them are bare. The main part of the island is fertile, but it is marshy in spots. The inhabitants live in several villages, of which **Kampung Pati** (8˚13'S., 127˚52'E.), on the S coast, is the most important.

Anchorage.—Because the coasts of Pulau Mao are steep-to there are not safe anchorages except during the change of the monsoons and at the beginning of the S monsoon anchorage can be taken almost anywhere off the S coast of the island. It is customary to anchor in depths of 40m, sand, about 183m from the coast reef. Currents set along this coast at a rate as high as 2 to 3 knots.

Small vessels can anchor in deep water off Kampung Pati on the S coast of Pulau Moa, during calm weather, but the sea is usually too heavy.

In the absence of strong winds and currents, temporary anchorage may be taken off **Kampung Klis** (8˚13'S., 127˚57'E.) at the bend of the S coast 5.5 miles E of Kampung Pati. The anchorage is 0.15 mile from the drying shore reef in 62m, sand, with the village flagstaff bearing 047˚ and **Tanjung Tutnei** (Toet Nei) (8˚15'S., 127˚58'E.) bearing 151˚.

Selat Lakor (8˚14'S., 128˚04'E.), a strait between Pulau Moa and Pulau Lakor, has a least width of 1 mile and is clear of dangers. Eddies and strong tide rips are frequently encountered off Kampung Moanga, a village on the E coast of Pulau Moa, and off the NW end of Pulau Lakor. The tidal currents set through this strait at a rate of 4 knots or more.

Pulau Lakor (8˚15'S., 128˚10'E.), E of Pulau Moa, is low and flat, but its tall trees make it a good landmark. The generally rocky shores are broken in places by short stretches of sandy beaches. There are several villages on the island. **Kampung Warwawang** (8˚13'S., 128˚09'E.), on a rocky cliff on the N side of the island, is conspicuous.

Kepulauan Babar

4.58 This group of islands consists of Meatiy Miarang, Pulau Sermata, and Pulau Babar, together with the smaller islands adjacent to them. Except for Meatiy Miarang, these islands are hilly and are good landmarks; furthermore they can be approached closely.

Meatiy Miarang (Meatimiarang) (8˚20'S., 128˚30'E.), a small, flat, and densely wooded island, is 16 miles ESE of the SE end of Pulau Lakor and near the E end of a drying reef 12.5 miles long NNW-SSE and about 5 miles wide. On the reef about 0.5 mile W of Meatiy Miarang is Morau, a low wooded islet, and close off the SE end are Djagat Tutun, two small rocky islets. On the NW end of the reef are Armortun and Meaterialam, two low wooded islets, the latter with a conspicuous tree on its W side. The sides of the reef are so steep-to that anchorage outside is impossible. The reef encloses a lagoon which can be reached from the E side through a channel 137m wide with a least depth of 5.5m in the fairway.

The entrance is marked, entering, on the starboard side by a white conical buoy, and on the port side by a black can buoy. A course of 222˚ leads into the lagoon. Inside there are numerous reefs, some of which may be marked by beacons. There is anchorage in the S part of the lagoon N of Meatiy Miarang, but local knowledge is essential. Strong tidal currents can be expected in the entrance channel. Meatiy Miarang is the only inhabited island on the reef; a light, from which a racon transmits, is shown from its W side. The island is reported to be a good radar target at a distance of 20 miles.

4.59 Luang Island (Loeang) (8˚11'S., 128˚42'E.) and Kalapa Island, 14 and 18 miles, respectively, NE of Meatiy Miarang are on a drying reef about 15 miles long on which there are several smaller islets. Luang Island, almost barren, has two conspicuous hills the highest of which is 260m high. The island is reported to be a good radar target at a distance of 26 miles. Kalapa Island the E most and largest island on the reef, is generally low but covered with tall trees. Metutun (Metoetoen) Island, 1.75 miles E of the W end of the reef is covered with high coconut palms. Small craft sometimes anchor at the W end of the reef. Luang Island is the only inhabited place of the group.

Pulau Sermata (8˚12'S., 128˚55'E.), close E of Kalapa Island, is a long narrow island with a chain of small, round, grass-covered hills running down its middle. The highest point on the island, 392m, is covered with trees. There are a number of villages on the island surrounded by high stone walls.

Anchorage can be taken in Lelang Bay on the S side of the island during the change of the monsoons and during the NW monsoon, but the bottom rises steeply and during the NW monsoon the anchorage is frequently made unsafe by sudden violent squalls. Because the bottom rises steeply elsewhere in the vicinity of Pulau Sermata there are no other anchorages. Local knowledge is necessary.

Pulau Babar (7˚55'S., 129˚45'E.), 40 miles ENE of Pulau Sermata, is fertile and covered with forests. There are several hills, the highest of which is 826m high and near the center of the island, but is not particularly conspicuous. More conspicuous from NW or SE is a group of hills in the NE part of the island. The coasts, sloping down from the hills, are fringed in places by a drying reef 0.1 to 0.15 mile wide. The water from the rivers of the island, as well as from those of Pulau Wetan, discolor the sea for a great distance.

Pulau Wetan (7˚55'S., 129˚32'E.) is 349m high at its S end and 137m high at its N end with a coral lime terrace between.

Selat Wetan, a strait separating Pulau Babar and Pulau Wetan, is deep in the fairway and about 1 mile wide in its narrowest part. A 6.7m shoal is on the W side of the S part of the strait about 0.5 mile off the shore of Pulau Wetan, 2.5 miles NE of the S part of that island. A 5.9m shoal is on the E side of the S part of the strait about 1.25 miles NE of the shoal just mentioned.

Currents, which are sometimes accompanied by a heavy swell, set N and S through the strait.

4.60 Herlei Road (7˚53'S., 129˚33'E.), on the E side of Pulau Wetan, affords comparatively safe anchorage in 50m. Vessels bound for Tepa (discussed below) during the NW monsoon frequently anchor here awaiting the opportunity to work cargo at Tepa. Swells coming in from the open Selat Wetan strait are frequently troublesome in this road.

Tepa Road (7˚52'S., 129˚35'E.), on the W coast of Pulau Babar, affords the best anchorage in the vicinity during the SE monsoon. With NW winds there is sometimes considerable sea and surf on the coast, but there is no danger of dragging unless the wind blows hard. There is room for several vessels in the road. During the NW monsoon, however, it is better to anchor in Herlei Roads (discussed above).

A reef with of depth of 1.8m is about 0.25 mile NW of the flagstaff at the village of Kampung Tepa.

Tides—Currents.—At Tepa Road the lowest water level, occurring in July, August and September, is 0.2m below mean sea level, and the maximum rise is about 2.5m above mean sea level.

Directions.—Vessels should approach Tepa Road anchorage with the flagstaff at Kampung Tepa bearing 090˚ and anchor in the desired depth. Allowance should be made for tidal currents which set N and S. When nearing the roadstead the depths decrease suddenly. It is recommended to lower the anchor with about 50m of cable out, and to approach as slowly as possible. During the NW monsoon, 81m of cable should be veered out.

Kampung Tepa (7˚52'S., 129˚36'E.) (World Port Index No. 52890) is at the S part of the bight abreast Tepa Road.

Note.—A blue flag at the flagstaff signifies cargo cannot be worked at Tepa. Vessels then ordinarily proceed to Herlei Road on the opposite side of Selat Wetan to await favorable conditions.

4.61 Southwest coast of Pulau Babar.—The SW coast of Pulau Babar is fringed by a narrow, rocky, steep-to reef. A detached reef, 0.15 mile wide and with a least depth of 4.9m, is 1.5 miles offshore and 5.25 miles WNW of the S end of Pulau Babar. This reef seldom discolors. Anchorage can be taken in a depth of 50m almost anywhere along this coast. The recommended method of anchoring is to approach the coast slowly with about 73m of chain veered out.

4.62 South and E coasts of Pulau Babar.—Several detached reefs with depths of 4.9 to 7.6m are close off the coast between the villages of Kampung Ahanari and Kampung Wakpapapi, 4.75 and 6 miles, respectively, NE of the S end of Pulau Babar. A 6.8m reef lies next to the coast 4 miles SSE of Kampung Ahanari. These reefs do not discolor. Another reef, 1.5 miles long and 91m wide, is 0.35 mile offshore from the village of Kampung Letwurong and has a least depth of 6.7m. This reef discolors and the passage between it and the coast is clear. Anchorage can be taken close to the shore anywhere along these coasts except in the bight in the N part of the E coast.

4.63 North coast of Pulau Babar.—With SE winds anchorage can be taken N of the village of Kampung Jatoke near the N extremity of Pulau Babar. For a distance of 4 miles W of this anchorage the coastal reef is so narrow and steep-to that it affords no anchorage, but beyond that and as far as the village of Kampung Manuwui, the N most point of the island, anchorage can be taken almost anywhere. Vessels should approach slowly with the anchor veered out 55m.

Off-lying Islands—Pulau Babar

4.64 Pulau Dai (7˚34'S., 129˚41'E.), about 12.75 miles N of Pulau Babar, is about 4 miles long and ranges from 0.75 mile to 1.5 miles wide. It has three summits of which the E most and highest is 651m high. Anchorage can be taken in the bight on the N coast opposite the village of Kampung Lewa. The anchorage should be approached slowly with the anchor veered out about 70m. The coast reef, however, is narrow and vessels are exposed to dangerous squalls, particularly during the SE monsoon. Boats can land near the village during calm weather.

Pulau Daweloor (7˚46'S., 130˚04'E.) and Pulau Dawera, about 10.5 miles NE of Pulau Babar, are about 7.5 miles long in a NW-SE direction. The maximum elevations of the two islands are, respectively, 293m and 334m. Both islands are inhabited. They are separated by a narrow reef-bordered strait with a least depth of 2.7m. Three detached shoals with depths of 2.8 to 4.9m are about 0.5 mile S of the S end of Pulau Dawera. A coastal reef with a depth of 1.8m near its outer end projects more than 1 mile W from the SW end of Pulau Dawera. Coast reefs extend into the channel from the SE extremity of Pulau Dawera and Pulau Daweloor.

Anchorage can be taken in depths of 55m during the SE monsoon in a bight on the W side of Pulau Dawera opposite the village of **Kampung Ilmarang** (7˚44'S., 131˚00'E.). Approach on a SE course along the shore of the island. The reef tongue projecting out from the SW extremity of the island can be readily made out in good visibility.

Anchorage can also be taken in 28 to 37m in **Watuwai Road** (7˚46'S., 130˚02'E.) in an opening in the shore reef at the W end of Pulau Daweloor. The tongue of the reef is marked by discoloration.

Pulau Masela (8˚09'S., 129˚52'E.), 6.5 miles SE of Pulau Babar, is 9.5 miles long and 1 mile to 1.75 miles wide. It has three summits the highest of which, near the center of the island, is 199m high. The island is surrounded by a reef which dries in most places and extends about 1.75 miles E from the S end of the island. A detached 12.8m shoal is 1.25 miles offshore about midway along the E side of the island. There are several detached reefs and shoals closer inshore on both the E and W sides of the island. The reefs on the E side, especially those less than 9.1m, are not as well marked by discoloration as those on the W side.

Anchorage can be taken anywhere around the island in depths of 55 to 70m. Vessels sometimes anchor in an opening in the reef on the SE side off the village of **Kampung Telalora** (8˚12'S., 129˚50'E.) when the reefs are marked by discolored water. During the SE monsoon, however, entry is not possible because there is too much sea at the entrance to the opening. Anchorage can also be had in Lawawang Road, on the W side of the island, in depths of 7.6 to 10.6m on a narrow bank which trends parallel to the shore and about 0.5 mile offshore. The coastal reef extends about 0.2 mile offshore, with occasional large rocks above water. The village of Kampung Lawawang, surrounded by a wall and standing on a hill 24m high, was formerly reported as visible above the coconut trees SE of the anchorage.

Kepulauan Tanimbar

4.65 This group of islands, E of Kepulauan Sermata and SE of Kepulauan Aru, consists of Pulau Yamdena (Jamdena), and about 66 smaller islands fringed by steep coral bluffs. Except for Pulau Molu, Pulau Maru, Pulau Fordate, Pulau Laibobar, and the larger islands off the W coast of Pulau Yamdena, the islands are low and flat. The S part of Pulau Yamdena, N and W of Teluk Saumlaki, at the SE end of the island, is hilly, but none of these hills are conspicuous. The points of Pulau Yamdena as well as the numerous islands around it, however, are useful in fixing position in this area.

Because discolored patches are frequently encountered in relatively deep water in the vicinity of the islands and because the reefs on the W side of Pulau Yamdena and Pulau Selaru and in Selat Egeron seldom discolor, it is imperative to keep a constant check on position and to pass close to the islands only when the reefs can be sighted readily. Cyclonic storms occasionally occur in these islands.

All of the larger islands are lightly inhabited, but the density of population varies considerably and is affected by the migrations of the inhabitants. Good pilots can be obtained in many of the villages. There are numerous coconut plantations and untouched oil fields are believed to be in the interior of Pulau Yamdena.

The islands are good radar targets at a distance of 18 miles.

Pulau Yamdena

4.66 Pulau Yamdena (Jamdena) (7˚30'S., 131˚30'E.), the principal island of the Kepulauan Tanimbar group, is 64 miles long in a NNE-SSE direction and about 24 miles wide in its middle part. It is a relatively flat island of coral formation. The low W coast is fronted by islets and reefs. The E coast, indented with several small bays and fringed by reefs, is closely backed by a number of small hills, the highest of which is 240m high and is about at the midway point of the E coast.

Islands North of Pulau Yamdena

Pulau Molu (6˚45'S., 131˚32'E.) and Pulau Maru, 4 miles S, are at the N end of Kepulauan Tanimbar. A hill, 274m high, is near the NW extremity of Pulau Molu, and another named Keljobar Wahan, 197m high, is near the SE extremity of the island. Lubwaan, the highest point of Pulau Maru, near the center of the island, is a conspicuous hill, 268m high. The islet, Pulau Kalbur, 0.75 mile N of Pulau Molu is uninhabited. The channel separating these two islands is clear of dangers, but there is sometimes a heavy sea on it. Pulau Wayangan is at the SSW end of a shore reef that projects out 2 miles from the S end of Pulau Molu.

There are villages around Teluk Loka and the W coast of Pulau Molu. Coconut plantations are on both Pulau Molu and Pulau Maru. There are many fishermen on the reef that projects W from the SW end of Pulau Maru during favorable weather.

Anchorage can be taken during the NW monsoon in Teluk Loka, a bight on the E coast of Pulau Molu. The reef that juts out from the N entrance is well marked by discoloration and vessels can pass it closely. Vessels can also anchor in 40m 0.55 mile NW of Kampung Adodo. There is good anchorage everywhere off the E coast of Pulau Maru in depths of 44m, except off the coconut plantations on the SE point of the island. Local knowledge is necessary.

The channel between Pulau Wayagan and Pulau Maru affords the best route for vessels coming from NW and bound for Ritabel Bay (which is discussed in paragraph 4.65), particularly during the SE monsoon. After this passage, shelter is also afforded by Pulau Fordate and Pulau Larat. Choppy seas are encountered frequently in this vicinity when the wind is blowing in a direction opposite to that of the tidal currents.

Nus Lima (6˚58'S., 131˚35'E.) is a group of islets on a reef 2.5 miles long and 2 miles wide, 6 miles SE of the S end of Pulau Maru. The reef discolors well but the shoals do not. Only Wermatan, the largest of the islets, is inhabited, and then only occasionally by natives working the coconut plantations. The channel between Wermatan and the small islet Pulau Kyabrengan, about 1 mile NW of the main body of the reef, is unusable. A 2.7m shoal is close S of Pulau Kyabrengan.

Pulau Frinun (7˚03'S., 131˚34'E.) and a conspicuous rock are on a reef 1.5 miles long and 1 mile wide 3.5 miles S of Wermatan. This island is low, very sparsely wooded, and uninhabited. The reef is well marked by discoloration. An isolated 5.8m shoal that does not discolor is 2 miles SE of the island.

Pulau Farnusan (7˚05'S., 131˚39'E.) is an elongated islet surrounded by a reef which discolors 1.5 miles off the N coast of Pulau Yamdena and 5.5 miles SE of Pulau Frinun. Temporary huts on the island are used at times by coconut plantation workers.

Metirotton, close off the N coast of Pulau Yamdena, is a roughly circular reef 1.5 miles in diameter, which is usually well marked by discolored water.

Pulau Larat (7˚09'S., 131˚51'E.), the W end of which is separated from Pulau Yamdena by a narrow channel which can only be used by small boats, is low and wooded. The island is skirted in most places by a reef. On the reef off the N side, 2.5 miles E from the W end of the island, is **Vatsori** (7˚06.5'S., 131˚45.0'E.) a rock which from the W has the appearance of a native canoe without masts and is a good landmark. Off the SW side of the island is Sari Karmut, a large reef. Smaller reefs and shoals extend 1.5 miles NW and 2.5 miles W from this reef. The channel between this detached reef and Pulau Larat is clear and can be navigated when the reefs can be seen.

Close off the W end of Pulau Larat is low, flat Pulau Lutur, connected to Pulau Yamdena by a 0.4 mile wide reef extending around the W end and along the N side of the island. **Watmomal** (7˚08.4'S., 131˚42.8'E.) is a very conspicuous rock close of the NE extremity of Pulau Lutur.

4.67 Ritabel Bay (7˚09'S., 131˚43'E.),between Pulau Lutur and Pulau Larat, is a well-sheltered rectangular area almost 1.5 miles long and ranging from 0.27 to 0.45 mile wide. The houses of the village of Kampung Ritabel can be seen for a distance of 8 miles on a clear day. The village of Kampung Watidal is on a hill on the W side of the bay 1.25 miles NE of Kampung Ritabel and the village of Kampung Lelinglun is opposite Kampung Ritabel on the E end of Pulau Lutur.

Beacons, one on the edge of the reef extending from the NE end of Pulau Lutur and the other on the edge of the reef extending NW from Kampung Watidal, mark the channel leading to Ritabel Bay. There is a 3.2m shoal 1.5 miles offshore N of Kampung Watidal.

Tides—Currents.—At Ritabel Bay the highest water level occurs in February and March; the lowest in July, August, and September. The maximums that can be expected are, respectively, 2.5m above and 0.2m below mean sea level.

Anchorage.—Anchorage is available in 15m, mud, in Ritabel Bay, about midway between Kampung Ritabel and the opposite shore of Pulau Lutur. Strong N winds send a heavy swell into this anchorage.

The S approach to Ritabel, between Larat and Yamdena, is only navigable by small local craft. There is a least depth of 0.6m in the fairway.

Kampung Ritabel (7˚09'S., 131˚43'E.) (World Port Index No. 52860) is on the W side of Pulau Larat and on the E side of Ritabel Bay. A pier, from which a light is shown, projects out to the edge of the reef from the shore abreast of the village.

Selat Orafruan (7˚05'S., 131˚55'E.), a strait between Pulau Larat and Pulau Fordate, is clear of dangers and the shore reefs on either side are well marked by discoloration.

Pulau Fordate (7˚02'S., 131˚58'E.), is very hilly with several conspicuous peaks. Villages are on the W coast and the S side of the island. At the village of Kampung Aweer on the W coast near the S end of the island is a small conspicuous

church. A rocky stretch is on the W coast between the villages of Kampung Sufanin and Kampung Adodo. Anchorage is available in 49m on both the E and W coasts, except off the rocky area mentioned above. Local knowledge is necessary.

Caution.—A shoal with two 8.2m depths and with a radius of 1.5 miles has its center about 5.75 miles E of the NE end of Pulau Fordate.

Pulau Nukaha (7˚05'S., 131˚59'E.), about 2 miles SE of Pulau Fordate, is an islet 39m high near the W end of a drying reef 3.5 miles long E-W and 2.75 miles wide at its E end. The reef is well marked by discoloration.

A stranded wreck is on the N side of the reef surrounding Pulau Nukaha.

Directions for the East Coast of Pulau Yamdena

4.68 Between September and March, the period when the NW monsoon blows hardest, it is advisable for vessels proceeding from Selat Orafruan around Pulau Larat and the S to Selat Egeron to pass fairly close along the E coast of Pulau Yamdena. From the S end of Pulau Larat set course to pass E of the Sari Karmut and Sari Karmuta, the extensive reefs S of the middle part of Pulau Larat, and then pass at least 1 mile off the conspicuous point on which the village of Kampung Watamuri is located, then keep about 2 miles offshore as far as Selat Egeron. This course leads considerably to the W of Sari Batsir, Sari Waturi, and Sari Kilmasa, which are parts of an off-lying chain of reefs paralleling the Pulau Yamdena coast at a distance of 6 to 7 miles. The N most reef is 7 miles SE of Kampung Watmuri and the southernmost is 11.5 miles farther SSW. In this chain there are drying reefs and reefs with depths of 1.8 to 9.1m. The only dangers between these reefs and the Pulau Yamdena coast are 4.9m and 3.9m shoals, respectively, 8.75 and 12.5 miles S of Kampung Watmuri; these are seldom marked by discoloration. A depth of 10m is between these last two shoals. A broad reef projects from the E side of Asutuban, an island off the SE end of Pulau Yamdena and on the N side of the E entrance to Selat Egeron.

Vessels with local knowledge can obtain anchorage off several of the villages between the villages of Kampung Watmuri and Kampung Tumbur, 33 miles farther S.

The river **Wari Tambrian** (7˚47'S., 131˚27'E.), discharges a stream of muddy water into an inlet about 20 miles NNE of Asutubun Island. Much of this water flows through the channel between Pulau Yamdena and **Pulau Mes** (7˚50'S., 131˚26'E.), 4 miles S of the river. Therefore, this channel should only be used when the water is clear and the reefs are plainly visible.

Caution.—A deposit of iron ore which causes a local magnetic disturbance is on the E coast of Pulau Yamdena, nearly abreast of the reef **Sari Kilmasa** (7˚39'S., 131˚44'E.).

An 11.9m shoal lies about 2.5 miles E of Kampung Alusi.

Selat Egeron, a strait separating Pulau Selaru from Pulau Yamdena, presents no navigational difficulties. Several islands and points of land are useful in passing through the strait. To vessels approaching from the W the hill at the S end of Nusa Anggarmasa, at the W end of the strait, is conspicuous.

To vessels approaching the strait from E, the low Matkus Island, 2 miles within the E entrance, seems at first to be a part of Pulau Yamdena. It does not appear as an island until within 5 miles of the strait. There is a coconut plantation on Matkus Island and due to the felling of coconut palms the aspect of the island is continually changing. Vessels coming from W approach with the N end of Nusa Anggarmas bearing 090˚; when the hill on the S end of the island is made out steer a southerly course until the hill bears 090˚, then steer for it until it is about 3 miles off; course should then be changed to pass through the middle of the channel.

Nustabun (8˚02'S., 131˚12'E.), a small islet 1.25 miles NW of Matkus, is on a bank extending SSW 1.5 miles and NNE 0.25 mile. This bank is seldom marked by discolored water. **Battjawat** (8˚02.7'S., 131˚11.1'E.) is a rock near the S end of this bank. Vessels crossing the strait between Saumlaki Bay and Adaut Road should take the channel between Matkus and Battjawat.

Saumlaki Bay (7˚58'S., 131˚17'E.), near the E end of Selat Egeron, is a marked indentation in the S coast of Pulau Yamdena. Saumlaki Road, on the E side of the bay, affords safe anchorage year-round.

Saumlaki Light is exhibited at an elevation of 9m from a white framework tower at the pierhead.

4.69 Kampung Saumlaki (7˚59'S., 131˚18'E.) (World Port Index No. 52870) is on the E side of Saumlaki Bay. A stone pier with a depth of 4.9m alongside its head, projects out from the shores of the village. Fresh water can be obtained from a pipe at the pierhead. A beacon marks the edge of the coastal reef 0.2 mile SW of the stone pier; about 0.75 mile S of the same pier at the oil depot, another pier projects 60m and has a berth at its head 20m long with a depth of 5m alongside. The zinc roof of a church forms a good landmark.

A light shows from the SW extremity of **Astubun** (8˚03'S., 131˚16'E.). A yellow mast lattice mast was reported about 0.5 mile N of the light.

Adaut Road (8˚08'S., 131˚06'E.), on the S side of Selat Egeron and at the N end of Pulau Selaru, affords safe anchorage year-round. The preferred anchorage is near the pier at the village of Kampung Adaut. A shed with a galvanized iron roof at the head of the pier is a good mark for entering and anchoring. A shoal with a least depth of 7.9m is in the NW approach to the roadstead about 1 mile SE of Nuyanat, and a shoal with a least known depth of 8.5m is in the middle of the entrance of the roadstead inlet.

Kampung Adaut (8˚08'S., 131˚07'E.) (World Port Index No. 52880) is on the E side of Adaut Road. A stone pier juts out to the edge of the shore reef just N of the village.

4.70 Pulau Selaru (8˚12'S., 130˚58'E.), the N shore of which forms the S shore of Selat Egeron, is generally low. Near the S end of the island, however, there is a hilly ridge with a maximum elevation of 72m, and on the NW coast near **Tanjung Watatutu** (8˚08'S., 130˚56'E.), there are some inconspicuous hills.

A light is exhibited on the coast about 2 miles S of the hilly ridge.

Anchorage.—In addition to Adaut Roads, which has been described above, suitable anchorage is afforded by Labuan Lemian and Labuan Olendir, two bights on the NW side of

Pulau Selaru, respectively, 12 and 18 miles NE of the SW extremity of the island. Local knowledge is necessary. The anchorage in Labuan Olendir, off the village of Kampung Namtabung and E of **Tanjung Watatutu** (8˚08'S., 130˚56'E.) and the reef extending 1 mile N from that point, is particularly well sheltered against W and SW winds. The coast reefs are usually well marked by discoloration.

Directions.—Vessels coming from E and bound NW along the W side of the Kepulauan Tanimbar group may round the SW end of Pulau Selaru at a distance of 1 mile off and then set a course to pass close S of the S end of Pulau Riama. This course avoids the 10m shoal 3 miles SW of the S end of Pulau Riama. There is a 5.9m shoal 0.5 mile NE of the N end of Pulau Riama. The channel between Pulau Riama and the reefs close off the W side of Pulau Selaru is deep and clear of dangers.

Caution.—An 8.3m and an 8.5m shoal are in the W approach to Labuan Olendir, about 8 and 9 miles, respectively, WNW of Tanjung Watatutu; an 8.5m shoal is 9.5 miles W of the same point.

An 8.5m coral patch is about 8.5 miles WSW of the SW end of Pulau Selaru.

A 10m shoal and a 9.1m shoal are 3 and 10 miles, respectively, E of the SE end of Pulau Selaru, and two 9.1m shoals are, respectively, 13.5 and 21.5 miles ENE of the same point.

A ridge with depths of 8.5 to 15.5m extends parallel to the SE side of Pulau Selaru between positions about 6 miles SSE and 10 miles SSW of the NE end of Pulau Selaru.

Off-lying Islands—West Coast of Pulau Yamdena

4.71 Pulau Seira (7˚41'S., 131˚03'E.), about 21 miles N of the NW end of Pulau Selaru, is separated from the coast of Pulau Yamdena by a narrow, shallow channel which is used by small native boats. A broad reef, not very well marked by discoloration, extends S and SW about 4.5 miles from Pulau Seira. On the W part of this reef, about 1 mile off the SW extremity of Pulau Seira, is Pulau Ngolin, a remarkable island with a heavily-wooded N half and a bare S half. About midway along the NW side of Pulau Seira is the village of Kampung Wailutu.

Bara Sadi (7˚48'S., 130˚48'E.), a drying reef 9 miles WSW of the S end of Pulau Ngolin, can generally be sighted for a considerable distance because of the surf breaking on it.

Depths of 10 to 12.8m lie from between 8.5 miles SE to 11 miles SSW from the S end of Bara Sadi. An 11.9m shoal lies about 2 miles W of the same spot.

Selat Yamdena (7˚35'S., 131˚05'E.), separating the W coast of Pulau Yamdena from its off-lying islands, is easy to navigate because there are numerous headlands and islands on which bearings may be taken. Because of murky water, sighting of reefs or shoal water should not be relied upon. Even the deep water of the strait is often discolored by mud stirred up by the currents. On clear days with a few clouds the murky water often gives the illusion of discolored water because of the shadows of the clouds.

4.72 Pulau Sukeler (7˚38'S., 130˚57'E.), near the middle of the S entrance to Selat Yamenda 2.5 miles NW of the NW end of Pulau Seira, is 42m high and is a good mark for entering the strait. A drying reef extends about 0.75 mile WSW from the W side of Pulau Sukelar. Lengwati Islet is near the outer end of this reef. A 7.6m coral shoal is 3.5 miles W of Pulau Sukeler.

Pulau Selu, 7.5 miles NW of Pulau Seira, has two conspicuous peaks in its hilly W part, Amat Dawah and Wuru Wuru, 211m and 207m high, respectively. On the reef that projects NW 2 miles from the NW extremity of Pulau Selu are several islets, of which Pulau Nitu, 76m high, is the largest and is a good landmark. Off Pulau Nitu as well as Tanjung Metanuan, the SW extremity of Pulau Selu, there are sometimes heavy tide rips that raise a heavy sea.

Tides—Currents.—Seaward of Pulau Selu, tidal currents set N and S at a maximum rate of 2 knots. Observations taken in Selat Yamdena during July and August and the first part of September showed a maximum drift of not more than 1 knot. Currents in the strait increase the discoloration of the water.

Pulau Wuliaru, the largest of the islands off the W side of Pulau Yamdena, is close E of Pulau Selu. It has several hills, the highest, 188m high, near the center of the island, but appears to be more nearly flat than Pulau Selu. The numerous dangers, usually marked by discoloration, around Pulau Wuliaru almost precludes any possibility of landing on the island.

Pulau Keswu (Kiswui) (7˚32'S., 131˚09'E.), 104m high, about midway between Pulau Wuliaru and Pulau Yamdena, is separated from Pulau Wolas, an islet E of it, by a narrow, deep channel, clear of dangers. Close E of Pulau Wolas are several reefs, some of which dry and form sandbanks. The passage between these reefs and the coast of Pulau Yamdena and that between Pulau Keswu and the edge of the foul rocky ground mentioned above, about 1.25 miles WNW of the NW end of Pulau Keswu, are clear of dangers. The coastal reef extending from the E side of Pulau Wuliaru is almost always marked by discoloration.

Nus Taram (7˚29.5'S., 131˚14'E.) are three small islets on a mud bank extending from the shore of Pulau Yamdena, 4.5 miles NE of Pulau Wolas.

Selat Wotap (7˚23'S., 131˚11'E.), separating Pulau Wuliaru and Pulau Wotap, provides easy access to Selat Yamdena to vessels coming from W.

Jarngur Rual and Jarnguar Raa are two well-wooded sandbanks on separate reefs in the middle of the strait and are, respectively, 1.5 miles SSW and 2 miles SE of the SW extremity of Pulau Wotap. Passage may be made on either side of these sandbanks. On the SW side of the strait are Pulau Natrool, 72m high, and Pulau Natraal, 52m high, respectively, 0.5 mile E and 1.5 miles ESE of the E end of Pulau Wuliaru. A 6.7m shoal is about 0.5 mile SE of the SE end of Pulau Natraal and a similar shoal is 0.5 mile SE of the SE end of Jarngur Raa. Foul ground extends a short distance NE from the NE end of Jarngur Raa. There is a 5m shoal 2 miles N of Natrool.

The narrow channel between Pulau Natrool and the NE side of Pulau Wuliaru is farther restricted by the coastal bank of Pulau Natrool, which has extended 0.13 mile.

Tides—Currents.—Tidal currents set along the axis of the channel in Selat Wotap at a maximum rate of 1 knot.

Directions.—The recommended channel through Selat Wotap is N of Jarngur Rual and Jarngur Raa. Approaching

from W, after sighting the SW extremity of Pulau Wotap, steer for Jarngur Raa on a course of 132˚. When the remarkable rocky point with a rock off it, 1 mile SE of the 93m hill at the SW end of Pulau Wotap, bears 013˚ change course to 102˚. Jarngur Raa will then be well open W of Pulau Natrool. When E edge of Jarngur Raa comes in range with the highest point of Pulau Natraal, bearing 218˚, change course to 131˚. The rocky point mentioned above will then be almost dead astern. This course leads into Selat Yamdena. Caution should be taken to avoid the rocks, dangerous to navigation, NW of Natrool and N of Natraal.

Vessels using the channel leading S of Jarngur Rual and Jarngur Raa steer in with these two islands in range bearing 097˚ until the W side of Pulau Natrool is in range with the E extremity of Pulau Wuliaru bearing 194˚, and then change course to 127˚. Keep on that course until the W extremity of Pulau Natraal comes in range with the E point of Pulau Wolas, bearing 196˚, and then proceed on an easterly course into Selat Yamdena.

Either of these channels can easily be navigated by eye when the reefs can be made out. A detached, partly drying reef, 0.25 mile SSE of the rocky point mentioned above in the directions for the N channel, is almost always marked by discoloration. The channel is also subject to the same misleading discoloration of the water that was mentioned in Selat Yamdena which was discussed above.

4.73 Pulau Wotap (7˚20'S., 131˚15'E.), on the W side of the N entrance to Selat Yamdena, is hilly with a maximum elevation of 189m near its center. On the W side are two small bays affording good anchorage.

Pulau Laibobar (7˚13'S., 131˚23'E.), 7.25 miles NE of Pulau Wotap, is very thickly wooded. A hill 156m high is at its N end, but the 391m elevation at the S end of the island dominates the entire Kepulauan Tanimbar group. On a clear day this can be seen from vessels on the E side of Pulau Yamdena. The S side of the island is indented by a bay affording good anchorage. The coastal reef of this bay discolors well, therefore there is no difficulty in entering. The channel between Pulau Ungar and Pulau Laibobar has a depth of 7.6m.

Pulau Ungar and Pulau Vulmali, respectively, 0.5 and 2.5 miles S of Pulau Laibobar, are very thickly wooded. A reef with several drying rocks is within 1 mile ENE of the N end of Pulau Vulmali.

Bolu Island, close to the shore of Pulau Yamdena abreast the S end of Pulau Laibobar, is low and wooded.

Caution.—A 3m shoal is about 0.75 mile N, a 6.7m shoal is about 1.5 miles NW, and 7.6m shoal is about 1 mile W, respectively, from the N end of Pulau Vulmali.

Pulau Mitak (7˚11'S., 131˚28'E.), which has a coconut plantation, is 3.25 miles ENE of Pulau Laibobar, and is separated from the coast of Pulau Yamdena by a narrow channel which is made almost impassable by many reefs which do not show up clearly because of opaque water. A small craft pier is on the S side of the island. A 4.1m shoal which does not discolor is 2 miles W of the SW extremity of Pulau Mitak, between that island and the N end of Pulau Laibobar. A rock awash, dangerous to navigation, is 1 mile NE of the N end of Pulau Mitak.

Karata and Kabawa are high conspicuous islets, respectively, 1.75 miles N and 2.5 miles NNW of the N end of Pulau Mitak.

4.74 Pulau Namwaan (7˚07'S., 131˚27'E.) and Pulau Itain, 6 miles NW of the NW end of Pulau Yamdena and 4.75 and 7.5 miles, respectively, NNE of the N end of Pulau Laibobar are being cleared for coconut plantations and are, therefore, constantly changing in appearance. The two islands are, respectively, 151m and 128m high. The channel between them is clear, but it is so narrow that it should be used only when the reefs along its shores are clearly visible. Depths of 10.9m or less extend more than 1 mile W and SW from the S end of Pulau Namwaan. Depths of 18.3m or less extend about 2 miles farther SW.

Pulau Temar (7˚09'S., 131˚26'E.), a low and well wooded coral islet, is 1.25 miles S of the S end of Pulau Namwaan. Two 10m shoal spots are within 2 miles W of Pulau Temar. These shoals as well as the reefs around Pulau Temar do not discolor well.

Two reefs, each of which has only 0.9m of water over them, are about 1 mile apart on a N-S line 2.75 miles E of Pulau Itain. These reefs show well.

Pulau Vatvurat (7˚07'S., 131˚27'E.) is separated from the NE side of Pulau Namwaan by a clear channel 0.33 mile wide. Off the S side of Pulau Vatvurat are two rocks, above-water, the N most of which bears a striking resemblance to a Madonna and Child.

Two reefs with depths of 0.9m lie close together about 2 miles NE of Vatvurat and are well marked by discoloration.

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